

PCPlus CAMPAIGN

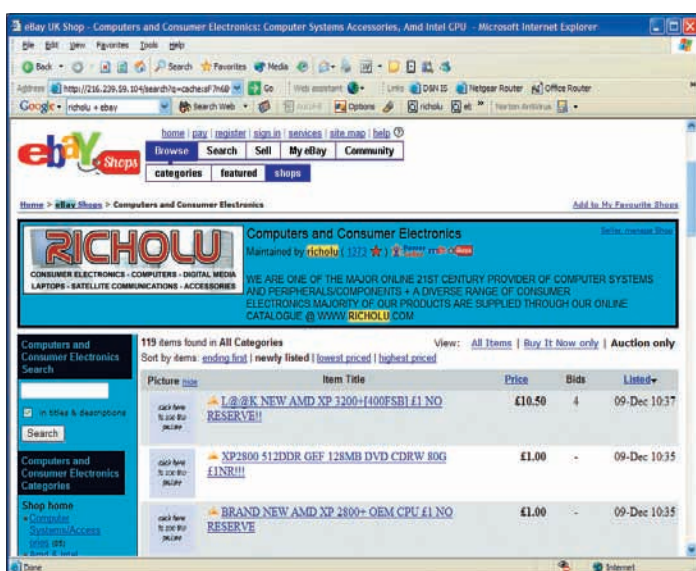
→ Let our resident legal expert fight your fight



Roger Gann
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After first qualifying as a solicitor, Roger Gann got suckered in to the dark world of computer journalism, and is now combining both these skills for your delight

This issue, **Roger Gann** goes on the hunt for the new PC, iPod Mini and Dell RAM that never arrived... Will it be a happy ending?



Paul Winship bought a new PC on eBay, auctioned by Richolu Computers – he has never received it, and has little comeback – always use a credit card when buying online.

Dodgy dealings on eBay

Some PC vendors choose to sell their kit in unconventional ways. In particular, some choose to sell them by auction on sites, such as eBay. I have to say that I would never in a million years contemplate buying a new PC at an auction – it's bad enough dealing with 'respected' mail order vendors! However, some punters clearly think they can pick up a bargain in this way. I'm sorry to say that my doomy concerns are borne out by the unhappy tale PC Plus reader Paul Winship brought to my attention.

"I am writing to you as one of a growing number of people who have lost tens of thousands of pounds to just one seller on eBay. We are hoping that you could maybe help us warn other unsuspecting members of eBay about the dangers of shopping online, and the ease with which it seems fraudsters and criminals can use the site with very little comeback. The only victims seem to be eBay members who unfortunately believed the assertions from eBay that its site was

a safe place to trade. Once things go wrong though, eBay takes very little responsibility and is extremely unhelpful in dealing with members who have had large amounts of money stolen from them."

Paul bid and paid for a PC auctioned on eBay by Richolu Computers, based in Stoke. He took all the right precautions and checked out the history of the seller, reading their feedback. Richolu was labelled as a 'Powerseller', which eBay defines as 'exemplary members who are held to the highest standards of professionalism, having achieved and maintained a 98 per cent positive feedback rating and an excellent sales performance record'. Richolu was also a member of Square Trade, which states that: 'Buyers will feel comfortable buying from you, knowing that you are a verified seller and that you will resolve disputes'.

Unfortunately, Paul's deal went very sour. "After relieving many of us of a great deal of money (a figure that could be as high as £250,000) the seller

suddenly stopped responding to all emails and did not send out any of the items that had been paid for. eBay has not been very helpful at all in this matter. It refuses to allow us to write on the message boards to see how many more people have been affected by this, and has basically washed its hands of the situation. As we're basing our decisions on its recommendations, we feel it's very unfair that eBay doesn't seem to want to take more responsibility."

Naturally, Paul took up his problem with eBay. He was surprised when the company confessed, in email replies to him, that: "We have no control over the quality, safety or legality of the items advertised, the truth or accuracy of the listings, the ability of Sellers to sell items or the ability of Buyers to buy items. We cannot ensure that a buyer or seller will actually complete a transaction."

Which tends to imply that all the eBay 'badges of respectability' a vendor may acquire are ultimately worthless.

Roger replies: Paul's rights of redress are extremely limited here – as the vendor essentially appears to have done a runner, his chances of getting his money back are close to zero. Presumably, as the company was incorporated a receiver will be appointed, but again I suspect its assets won't be enough to cover its liabilities. Those who paid via credit card should be able to get a refund – the credit card company is jointly liable with the vendor for transactions over £100. Clearly a crime has been committed here. It seems the company acquired limited liability a matter of days before it shut up shop.

I asked eBay's Head of PR, Victoria Sayers, a number of pointed questions about Richolu and how eBay was helping customers that had lost money. Paul's experience was mirrored by mine when I asked for details of the fraud. While eBay was happy to provide general answers, it proved remarkably tight-lipped about any detail on this incident,

WRITE IN

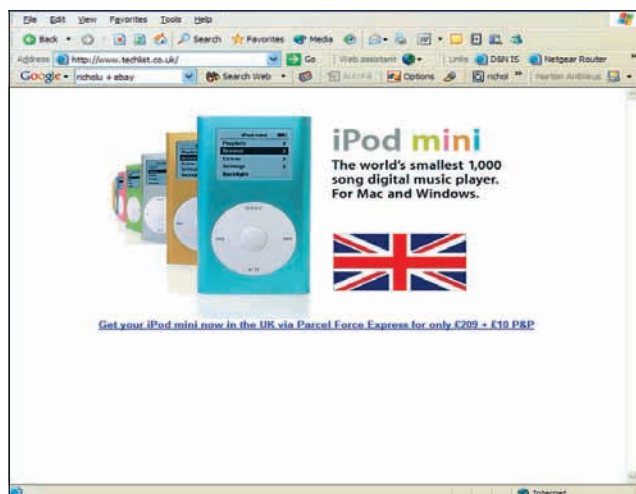
Your opinions count

If you have a gripe with a company, a compliment for one, or even a suggestion for future Campaign topics, we want to hear from you. To help us help you, please include all appropriate reference/serial numbers and your full contact details.

✉ campaign@futurenet.co.uk
✉ Fax a printed letter to
Campaign – 01225 732295

✉ Send a printed letter to:
Campaign, PC Plus,
Future Publishing,
30 Monmouth Street,
Bath BA1 2BW

FORUM <http://forum.pcplus.co.uk>



Uros Trnjakov ordered an iPod Mini from US site www.techlist.co.uk, and made his payment via PayPal. He waited 40 days and no iPod arrived. He was then told by PayPal that the time-limit for comeback is 30 days after payment...

relying on things like the Data Protection Act, and the fact that the seller is now the subject of a current police investigation to avoid giving out even general information, such as the number of victims.

Victoria Sayers did confirm, however, that eBay's own Buyer Protection Program would be able to offer victims a maximum of £105 in compensation. Which is better than nothing, though not far short of it when dealing with a PC purchase. A further £250 compensation is also available if PayPal was used, but you have to lodge a complaint within 30 days. According to Victoria Sayers, only 0.01 per cent (1 in 10,000) of transactions on eBay are fraudulent. It's a pity the highly profitable eBay (it made a whopping \$200m profit in the first three months of 2004) can't offer better compensation to the few bidders that are ripped off – it can certainly afford to.

My advice to PC Plus readers is not to buy high-price tag items at online auctions unless you really know what you're doing and you're prepared for the worst. And if you must buy kit in this way, always use a credit card – you'll get much more protection than that offered by eBay. And if a vendor can't take credit cards, walk away!

An iPod Mini adventure!

And now for a tale about a reader being royally messed about by an overseas vendor. Uros Trnjakov couldn't wait for the official UK release of the much sought after Apple iPod mini. Impatience got the better of him, so he ordered one from the States. Uros fills in the rest of the details:

"I ordered (and paid for) an iPod Mini from a company called LAMG/Techlist (www.techlist.co.uk). Although the site claims that the usual delivery

period is three to four weeks, all I have received from them until now is a couple of emails. Immediately after placing the order, I received an email asking me whether I want the iPod to be engraved or not, to confirm the mailing address, etc. It all looked fine at the beginning – as it usually does.

"But since that initial email, I haven't received any serious communication from Techlist. I've tried contacting them many times, but haven't received any response, apart from a couple of mass-mailed messages, basically saying, 'please wait'. I've noticed that their website continues to be updated; the price for the iPod has increased, and they have added accessories. There are obviously people still active behind this operation, and most likely people still ordering from them. Some research on the web yielded a few comments by other users who have experienced the same problems.

"Another interesting detail, is that the payment has been done via PayPal. After about 40 days of waiting, I tried cancelling my payment through PayPal, just to learn that there's nothing I can do if more than 30 days from the payment have expired. Of course, it was my own fault for not reading PayPal's terms and conditions carefully, but one of these terms explicitly says that delivery times longer than 20 days are unacceptable. Still, PayPal allows Techlist to do their business through them, although Techlist's official line on this matter is: 'You should expect delivery in three to four weeks' (taken from the FAQ page of their site at <http://techlist.co.uk/index2.htm>).

"Please let me know if there is anything at all you can do to help me. Any information you could find would be very much appreciated. I'll be happy to provide more details should you need them."

Roger replies: Sadly, Campaign's writ extends no further than that of British justice, and so resolving problems with US-based vendors are quite literally beyond our reach. Uros' footwork is quite true – there are no end of moans about Techlist (which despite the UK domain is a US outfit) on the forums at www.ipodlounge.com, so he is not alone.

However, the stories aired there seem to be mixed. Many complain of delays and silence, while plenty crow about the new personal stereo they've received. While the owner of this outfit seems a bit elusive (the LAMG aka Los Angeles Macintosh

Group user group seems to be largely defunct), he does seem to be delivering the goods – albeit very slowly. I suspect that the long and the short of it is that iPod mini stocks in the States are low to non-existent, and hence strictly rationed. Techlist might have hundreds of iPods on back-order, but only receive a handful each week from Apple.

As Techlist is based in California, the chances of being able to apply pressure, legal or otherwise, upon the company unfortunately seems very slim. And if it hasn't got any iPod minis, that's that. So it looks like Uros is going to have to be patient for the time being. And when it does turn up, the next downside of the matter is that he should be prepared to pay as much as £60 in import duty and VAT.

The fact that this vendor only accepted payment via PayPal is another warning sign – as I said about eBay, if the vendor doesn't take credit cards you should definitely think again – unless you

don't want good payment protection. The terrible irony is that when Uros' iPod does finally turn up, it'll probably cost more than the UK version, which

should be available soon this side of the pond!

Dell delivers – finally

Andrew Monteath has done battle with the mighty customer relationship management system at Dell Computers, and retreated feeling bruised and unloved. His tale does, however, have a very happy ending. All he wanted to do was buy some RAM for his Dell Dimension. Not only could Dell not send him the right memory, it didn't seem to want to sort out its glaring error. Andrew was extremely patient with Dell, but it got him nowhere.

"Five weeks ago I ordered 256MB of extra memory from Dell. It arrived three days later, but it was immediately apparent that it was not the right one. I emailed Dell the same day via their 'wrong shipment' web page, which undertakes to answer in 24 hours. I had no reply. I then rang twice and sent another email. I then sent a letter to Bracknell. None of this elicited any response. I have rung another six times. During every phone call I have been told that I would be called back 'within one hour', 'within three hours' or 'by the end of business' to be told what they were going to do about it. It has never happened – I have yet to

receive a single phone call or email! On the 25 May a van turned up – unannounced – to collect the memory, which it did. But to date I have still not received the refund of £121.97.

"I specifically ordered from Dell, and by phone rather than the website to be sure of getting the correct memory for my machine. That they could not get it right for one of their own products is disappointing. Their performance since has been nothing short of abysmal."

Utterly frustrated with the matter, Andrew gave up on Dell and instead turned to Campaign to sort it out – which he's extremely glad he did, because this happened:

Paula Warmer at Dell replies: Dell's customer escalations department has been in contact with Mr Monteath and apologised to him for his experience. They have since arranged for the refund of the memory in addition to a gesture of

goodwill in recognition for the inconvenience caused, which the customer has confirmed it is happy with.

Roger replies: Actually, for once Paula is being a little too modest here, as Andrew's follow-up email to me revealed. "Three (working) days after I contacted you I received a message from a Miss Greene of Dell, apologising for the problems and undertaking to put them right. The refund has now arrived back in my account and I have also been presented with an MP3 player. Please accept my sincere thanks for your intervention – and using your considerable influence to get Dell to do in five days what I had failed to get them to do in five weeks."

Now that's what I call a happy ending. Other PC vendors that 'fail to deliver' (and that means most of them) please take note: complaints

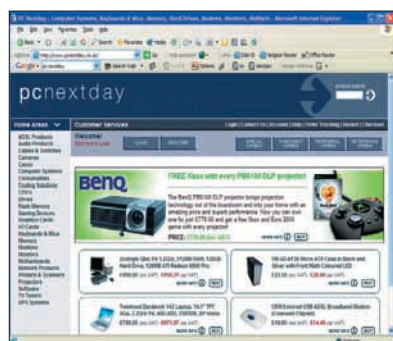
about vendors that crop up in this column cause no end of damage to their precious goodwill, and even relatively small gifts by way of compensation go a long way to repairing the damage done, particularly in the eyes of potential customers. The cost of such compensation is negligible in terms of the goodwill it repairs.

So, it's a complete mystery to me why so many vendors take the shortsighted view that a simple apology will suffice – maybe margins are so tight they can't afford to offer real compensation. They end up looking like unprofessional cheapskates – doing even more damage to their goodwill in the process. So well done Dell for making the gesture! Let's hope it won't be the last vendor to put its hand in its corporate pockets and fairly compensate a customer it has let down badly. **PCP**

GOOD GUYS OF THE MONTH

Three tales of happy shopping

This issue, a round of applause from the PC Plus team and a Good Guys award goes to PC Nextday and AOC



Not one, but two readers wrote in about the sheer efficiency of PC Nextday this issue. One ordered a BenQ at 10pm on a Monday and received it 10am Wednesday.

I'm going to kill two birds with one stone this month, as we've had two Good Guy nominations in respect of the same PC vendor this month: PC Nextday. I know you're probably thinking 'That sounds a bit fishy', but I'm in a generous mood this month and for once I'm going to allow it!

The first reader to get in touch with us about PC Nextday was Ian Allen, who writes to tell us of the good service he's received. "What a brilliant bunch the staff are at PC Nextday! I bought a faulty motherboard last week. After notifying it of the fault, and the fact that a business was relying on the unit, as it was their only PC, the company issued a returns number within two hours. I sent the board last Thursday morning and I received my replacement Tuesday morning – that's less than a week. No quibbles, no fuss – thanks PC Nextday. Heartily recommended!"

Reader Alex Cole, meanwhile, has similar glad tidings he wants to share about this outfit. "After seeing what your other readers had said about outstanding customer service when purchasing or returning computer hardware, I thought I couldn't let PC Nextday get away without a mention. I ordered a BenQ Joybook 3000 at around 10pm on a Monday evening, and the laptop arrived at 10am Wednesday morning. Wow – that's all I can say!"

"When it was delivered I was at first a little worried about the broken seals on the packaging – the warranty would be void if the seals were broken. One quick email to the company, and five minutes later I was put at ease by its great customer service. Everything I have ordered

since then – flash drives, memory cards, headphones – have all arrived early the next day, even when ordered up to 4pm!"

A reader's Bank Holiday crisis

And now a Good Guy tale guaranteed to warm the cockles of any grizzled Campaign reader's heart. Michael Wild got extraordinary service from monitor manufacturer AOC, which seems to run on greased lightning.

"At about 3:30pm on Friday (one before a Bank Holiday), my AOC LM720 17in LCD screen packed up. As it was only a year old and came with a three-year warranty, I filled in the RMA form on AOC's website, but (based on my previous experience with other warranty returns) with no real expectation of especially rapid action. At that stage, their system sent me an automatic email acknowledgement.

"Come 10am Tuesday, I got a call from AOC. They can ship me an exchange unit by courier, will that be okay and do I still have the original box? The replacement arrived today and is now in and working. Of course, this is how warranties should work. You can be sure that next time I'm looking for a screen, I will be considering AOC."

Michael Wild

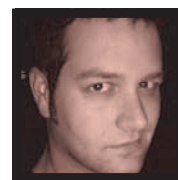
Roger replies: How is it that some companies can do this (and make a profit), and yet it's quite beyond others? Beats me! ■



Michael Wild is still singing the praises of monitor manufacturer, AOC, which busied itself over a Bank Holiday weekend to sort out a replacement LCD screen.

Illustration: Simon Parr





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Dan DiNicolo is an IT consultant based in Toronto, Canada. He has advised on cost-saving for corporate clients for many years now



Some of the apps mentioned in this feature are on your cover disk

Waste not want not

You could junk your old PC, but why not be creative? **Dan DiNicolo** explains how you can get extra mileage from your old system

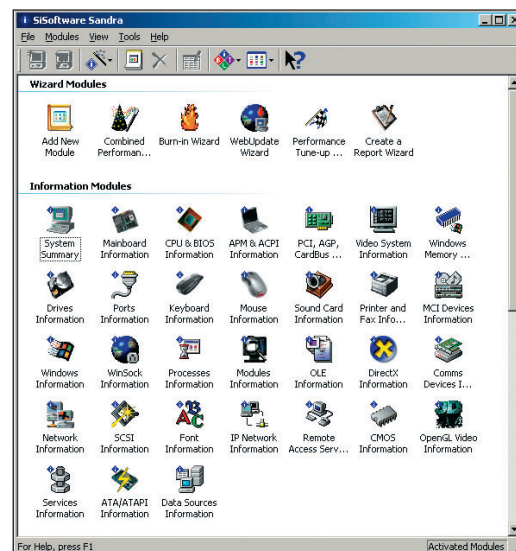
The most common reason for purchasing a new PC is the feeling that your old system is too slow and no longer meets your needs. Newer operating systems, and particularly multi-media applications have more demanding hardware requirements than their predecessors, but these don't necessarily make your old system obsolete. While your old PC may not be powerful enough to use as your everyday desktop system, with a hardware upgrade or two you can certainly boost your old system into one that is serviceable – and very useful.

This isn't to say that hardware upgrades are required to make your old system useful. In fact, many old systems can be 'rejuvenated' by simply stripping away programs that are no longer required and taking advantage of core features of your installed operating system. For example, old PCs are often perfect for use as file servers or back-up systems, even running Windows 95. While it's easy to see your old system as junk, finding new uses for it only requires a little creativity, and we're here to help!

Assessing hardware

While you won't necessarily need to upgrade anything on your old system, a few simple hardware improvements never hurt, especially if you intend to combine some of the possible roles outlined here. There's no need to go over the top, but you do need to consider how the old system will be used. For example, adding more RAM will help if you plan to use the old system as a second or back-up desktop, but a larger (or second) hard drive is a better choice if back-up storage space is what you're after.

If your old PC isn't already equipped with one, you should definitely consider adding an Ethernet network card. In conjunction with a small hub or switch, this will enable you to implement a home network between your systems, and share your Internet connection



SiSoft Sandra is a great diagnostic tool for determining your old system's hardware capabilities and specifications.

(broadband or dial-up) as well. Networking your old system is one of the easiest and most cost-effective ways to extend its useful life.

Before you run out and purchase any new hardware for your old system, you'll want to be sure that you are getting what your particular system requires. For example, newer PC 133 RAM won't be compatible with your old system if it requires EDO memory. The best way to get the right specs for your old system is to download and install a program like SiSoft Sandra (www.sisoftware.co.uk). This great diagnostic suite will supply you with all the

DYNAMIC DNS

Having your own servers running can be a tricky business. Almost all ISPs allocate IP addresses dynamically, so your public address is likely to change regularly. If your address has changed, your servers won't be of much use to you or those you want to have access, so you'll need to consider using a DNS service to make your systems accessible by name.

Of the free dynamic DNS services available, the best is probably the one found at www.dyndns.org. When you sign up you can choose your own servename, provide your current IP address, and then access your server at <http://yourname.dyndns.org> or one of its other available domain names. Better still, install the client packages available for download at this site – these will update the servers automatically with your new IP address every time it changes.

information you need to upgrade your old system, from the type of memory it requires through to the expansion slots available on your motherboard.

Back-up system

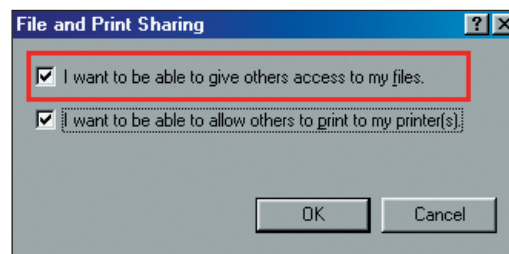
One good reason for holding on to your old PC is that you can use it as a spare or back-up machine. If you plan to hold on to your oldie for this purpose, take the time to prepare it. For example, consider reinstalling its operating system, applying any necessary service packs and patches, and then installing only the programs that you absolutely require should your new system fail you. Trust us when we say that having a fully functional system on standby (even if stored in a closet) will be a huge help if your new system starts acting up.

Along similar lines, one of the most obvious ways to make good use of your old system is to set it up for your family (or visitors) to use. This avoids having them wreak havoc on your new system, and provides them with a system that is perfect for common school-related tasks like word processing. Better still, install a network card and share your broadband connection with the old PC as well. If you do share Internet access in this way, make a point of installing parental control software (such as Net Nanny) on the old system for better control over children's surfing activities.

File server

One of the most practical uses for any old PC is as your own personal file server. The best part, is that you don't need any fancy server software to pull it off – as long as your old PC has the Windows File and Print Sharing component installed and enabled, all you need to do is share a folder and you can begin saving files to the old system. You'll need a network in place to do this, and an appropriate amount of free disk space on your old PC.

The benefits of having your own file server running are almost endless: you can use it to save back-up copies of data from your primary system, as a storage location for



In order to transform your old Windows system into a useful file server, you'll need to enable File and Print Sharing.

all your MP3 and media files, or even as a network-based extension of your new hard drive. Once the old system has shared folders set up, you can map a drive letter from your new system using My Network Places, and then open or save files to that drive letter seamlessly. If you haven't been very diligent about backing up your personal data, then use your new file server as the excuse you've been waiting for.

Router and firewall

If you're worried about security (and you should be!), then consider using your old system as a dedicated router and firewall. If you haven't purchased a hardware router for your home network yet, you'll be pleased to know that your old PC is likely to be up to the task – albeit with a few modifications.

Assuming you've got a broadband connection, start by installing two network cards in your old system: one to connect to your cable or DSL modem, and another to connect to your internal network. If you're using a dial-up connection, then one network card will suffice, together with your modem.

To get your system functioning as a router, your best bet is to use the Internet Connection Sharing (ICS) feature of Windows 98SE or later. Simply access the properties of the network card (or dial-up connection) that connects to the Internet, and use the Sharing tab to enable ICS. Once configured, your old system will act as a router for your internal system, and will even allocate the proper IP addresses to your other PCs via its DHCP component. For systems that don't include ICS, you'll want to install a



The parts of your old PC could be worth more than the whole. It may be time to tear that machine apart!

Creative salvaging

When the end is near, old PC parts are often worth holding on to

If you just can't find a use for your old PC and can't even give it away, take the time to salvage whatever useful parts you can before you get rid of the machine. Although the system as a whole may no longer meet your needs, you may not be aware that just about every PC contains more than a few useful parts worthy of living on as spares.

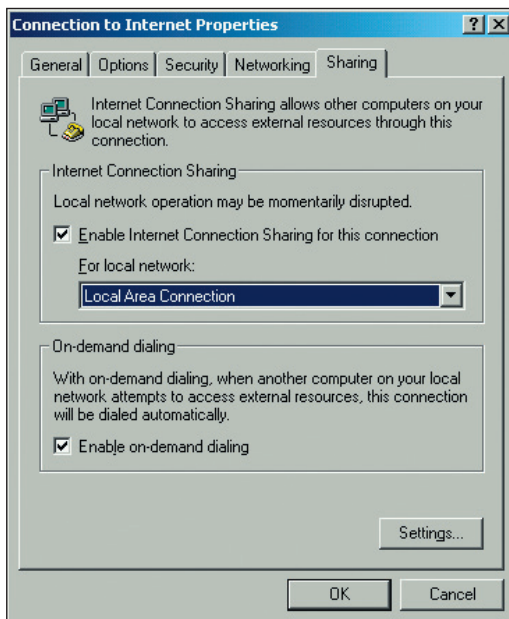
While the majority of motherboards in most new PCs include just about every conceivable integrated add-on, this was seldom the case only a few years ago. As such, it's quite likely that your old system is loaded with expansion cards that you might one day find a use for, as well as a slew of other useful bits and pieces.

High on the list of things to salvage from your old PC is its display adaptor, especially of the PCI variety. PCI adaptors (as well as AGP models) are capable of being used in a multiple monitor set-up, so you might want to add it to your new PC (along with your old monitor) to increase your Windows

desktop real estate. Just about any old expansion cards also seem to have a way of coming in handy eventually, including old ISA sound cards and even old Parallel Port adaptors.

While the RAM in your old system isn't likely to do you much good with the new one, the chances are that your old hard drive is still fine to use as a second disk – every little bit of space helps. Similarly, consider adding your old 12x CD drive to your new system to speed up disc copying. Since most systems today ship with a burner only, this will avoid the need for files to be copied over to your hard disk first.

Finally, the critical parts that almost everyone forgets: those tiny little screws that hold the case together and the drives in place. It's almost a computing law that for every four screws you remove from a system, one will mysteriously disappear. Just be sure to keep them in a secure place, in case they attempt to make the run to freedom. ■



To get your old system to function as a router, you can either use the Windows ICS feature or install proxy server software.

proxy server to be able to share your Internet connection.

As for the firewall component, we recommend installing a home firewall software package like Norton Internet Security or ZoneAlarm. Both products enable you to control exactly which programs are granted access to the Internet, and they also make it possible to place restrictions on which internal computers have access, too. Both will enable you to define exactly which types of traffic can enter your network, such as requests directed at an internal FTP or web server.

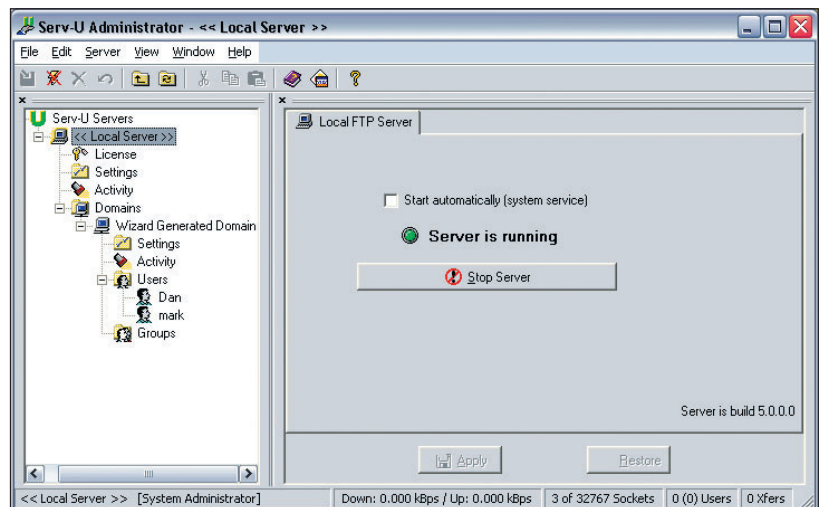


Use a personal firewall software package like ZoneAlarm as the perimeter defence for your broadband Internet connection.

FTP server

If you regularly need access to your files either at the office or on the road, setting up your own personal FTP server may be the answer. Once you have the appropriate FTP server software installed (Absolute FTP 2.2 from last issue's cover disc, for example), you'll be able to upload and download files to and from the server via any system with an Internet connection. It's also a great facility for sharing large files with friends and colleagues, without the hassle of email attachment size restrictions.

To get an FTP server up and running, your old system should have a network card installed with shared access to your broadband Internet connection. While you

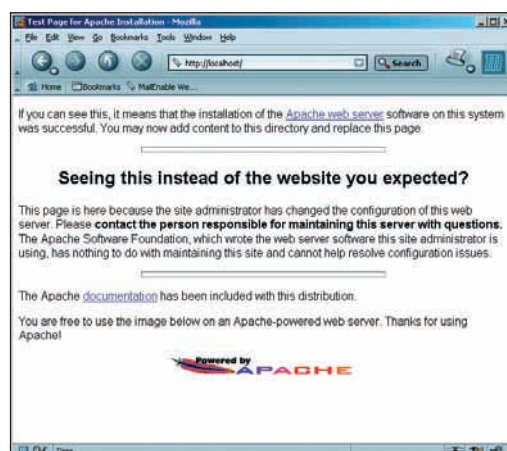


could go out and purchase an industrial-strength FTP server software package, apart from our giveaway last issue you could install Serv-U Personal, a download that's freely available from www.rhinosoft.com. The free version enables you to create up to five user accounts and supports up to two simultaneous connections, but lacks advanced capabilities like the ability to implement user download quotas. Connect to your server using either Internet Explorer or a dedicated FTP client like Cute FTP.

If you do decide to use your old system as an FTP server, you'll need to open TCP Port 21 on your firewall and specify the IP address of your old system to allow access from the Internet.

Web server

Still thinking of getting rid of your old system? Well there are even more uses for it that you may not have considered. Another great way to utilise an old PC is to set it up as your very own personal web server. If you've been itching to design your own website, you could use your web server as a handy way of checking your design before you upload it to your hosting provider.



Getting your own Apache web server up and running only takes a few minutes, and it provides a convenient way of testing your web page design, prior to the site going live.

If your old system runs Windows XP Professional, setting it up as a web server is as simple as installing the Internet Information Services (IIS) component. Because most old systems won't be running Windows XP, the best option is to download and install the popular (and free) Apache web server from <http://httpd.apache.org>.

While having a web server set-up is a great way to test your designs, there's no reason why you can't

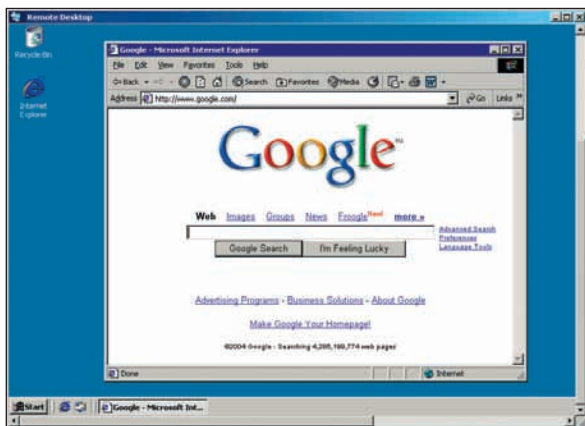
With your own FTP server set up, you'll be able to share large files with friends and family without any hassle.

DONATE YOUR PC!

If you're intent on getting rid of your old PC, giving it away to a friend or donating it to a local charitable organisation is a much better option than simply throwing it away. While the PC may have outlived its useful life for you personally, someone else will be able to get a little more out of it, so give the idea some thought.

If you're stuck for a way to donate your old system, check out www.donateapc.org.uk or www.computersforcharity.org.uk. If you do choose to donate, be sure that you scrub the hard disk first to be sure that all of your personal data is erased. A great tool to securely erase drives is Darik's Boot and Nuke, available as part of the free Eraser suite at www.heidi.ie.





With the Remote Desktop Connection client installed, older systems can connect to Windows servers as thin clients.



Neoware's Eon e309 (reviewed in PC Plus 218) may have been specifically built as a thin client, but your old PC is perfectly capable too.

make your site accessible on the public Internet. While most ISPs explicitly forbid running any server over a home broadband connection, it shouldn't be an issue unless traffic gets out of hand. To make your website easier to access, look at using a free DNS service like DynDNS, (as explained in the 'Dynamic DNS' sidebar – page 146). Assuming

that you have a firewall, you'll need to forward requests for TCP Port 80 to the internal IP address of your old system.

Thin client

You've probably heard the term 'thin client' bandied about on several occasions. In simple terms, a thin client is a PC system that functions in a manner similar to a 'dumb' terminal in the mainframe world. Based on the concept of centralised computing, all of the processing in a thin client environment happens on the server, allowing for very low hardware requirements on client systems. Effectively, the PC runs a client program (Remote Desktop Connection) that makes the server's Windows environment appear on the screen. The user interacts with the desktop and programs using their local keyboard and mouse, but everything is really happening on the server.

If you work in an office environment that runs Windows 2000 Server or Windows Server 2003, you might want to consider implementing the built-in Terminal Services feature – and with it, you'll find yet another valuable use for an older system. With Terminal Services running on the server, any old PCs running Windows can be given a new life as thin clients, providing users with access to all of the latest and greatest applications, which would be installed on the server rather than individual desktops. If you're thinking that your PC isn't up to the job, bear in mind that even a Windows 95 system with as little

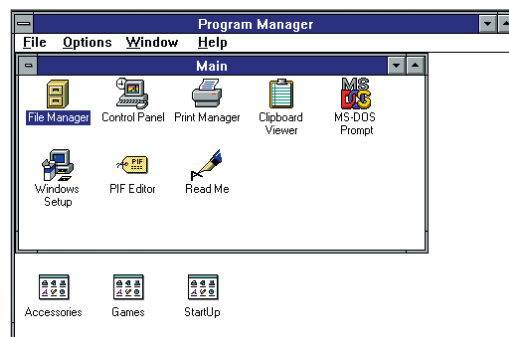
"You might be pleasantly surprised with how far that old 1GB hard disk and 16MB of RAM can take you."

as 16MB of RAM can make an effective thin client, and help you to get many more years of use from that old PC.

Downgrade?

It sounds crazy, but rather than upgrading your old system to support newer operating systems and packages, why not downgrade and use the old PC to run software better suited to its capabilities? For example, you may still have a copy of Windows 95 hanging around, or maybe even (gasp!) Windows 3.1. Neither is suitable for power users with high-end software needs, but either OS could easily be used to run basic applications like a word processor, or even as a second Internet terminal for visitors.

Remember that your old system is obsolete because of the increased hardware requirements associated with new software. If you move back to installing an operating system and packages that were designed at a time when requirements were lower, you might be pleasantly surprised with how far that old 1GB hard disk and 16MB of RAM can take you. So, consider dusting off those old floppies and getting down to business – if nothing else, it may just be a fun trip down memory lane! **PCP**



Want that old PC to feel lightning-quick again? Not an issue if you downgrade to a classic operating system like Windows 3.1.

Fun with Linux

Use your old PC to get acquainted with everyone's favourite penguin

Use Samba (www.samba.org) to make your Linux system appear like a Windows server.



First things first: don't expect any computing miracles if your old system has under 32MB of RAM. Unless you're a command-line hack, you'll probably want to get your feet wet with Linux using one of the many graphical user interfaces available, such as KDE or Gnome. While a system with less than 32MB of RAM is typically more than enough to run Linux from the command-line, graphical interfaces can easily require 128MB or more for smooth operation.

If you do decide to give Linux a go with your old box, you'll need to obtain a suitable distribution

for your old system. You can order Linux CDs online, or download the ISO images for most popular distributions and burn your own CDs (a broadband connection is highly recommended). Consider starting with a more user-friendly distribution like Mandrake Linux, a desktop alternative that is considerably easier to get your head around than some of the server-oriented releases like SuSE or Debian. A great site for downloading the necessary ISO images for just about every major distribution is www.linuxiso.org.

Although the Linux installation process is pretty straightforward for distributions like Mandrake, you may still encounter some issues with different hardware devices. It's not uncommon to have problems getting your network card or modem to work, although newer distributions tend to be pretty good about detecting and

installing all necessary drivers for your hardware in a plug-and-play fashion. If you do run into issues, however, there are tons of great support sites out there for newbies to ask questions, including www.linuxquestions.org.

The real fun begins once Linux is installed. Take the time to browse the various programs and utilities included with your distribution – you'll find that most are incredibly similar to their Windows' counterparts, even if the names and layouts are a little different. Try using Linux as an alternative to Windows for browsing the web or checking your email. You can even fool your Windows clients into seeing your Linux system as a Windows server by installing Samba (www.samba.org).

Most importantly, don't let Linux frustrate you. It may not be Windows, but it's a decent system once you get the hang of it. ■





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Gary is a freelance journalist and a regular contributor to PC Plus. He is currently awaiting delivery of his fifth camera phone

Occupational hazards

RSI ruins lives and can end careers, yet many sufferers can face a rough ride from employers. **Gary Marshall** uncovers the controversy

Welcome to a world of pain: a world where everyday tasks such as driving, cooking or doing the ironing can have you in tears; where ten minutes of computer work can be agony; where even hugging a family member can make you want to scream. The pain can plunge you into depression, or force you into unemployment.

Repetitive Strain Injury (RSI) can do all of these things and more. According to the TUC, 1 in 50 UK workers suffer from RSI, and six people in the UK leave their jobs because of RSI every day. 60 per cent of Swedish office workers have RSI symptoms, as do 60 per cent of Australian children who use laptops at school and 40 per cent of Dutch university students. And yet RSI, apparently, doesn't exist.

Court controversy

In 1993, financial journalist Rafiq Mughal brought a legal action against the news agency Reuters, claiming that his employment was responsible for his debilitating RSI. The judge ruled that the term RSI was "meaningless" and had "no place in the medical books". The National Union of Journalists, which supported Mughal's action, and represented more than 200 other sufferers, was "horrified".

Unfortunately, when the judge said "RSI is not a disease or a diagnosis", he was absolutely correct. RSI is a label, a catch-all term for dozens of different conditions: Carpal Tunnel Syndrome, Writers' Cramp, Tennis Elbow, Trigger Finger, Vibration White Finger, Tendinitis, Frozen Shoulder and so on. While many of these conditions can be the result of people's jobs, only five of them – Carpal Tunnel Syndrome, Tenosynovitis, Bursitis, Writers' Cramp and Vibration White Finger – are taken seriously by the Industrial Injuries Advisory Council. If you suffer from one of these five conditions, you may be eligible for

industrial injuries benefits; if you leave work because of a different RSI, you may be unable to claim unemployment or disability benefits.

The conditions we call RSI seem to have very little in common: Tennis Elbow is very different from Trigger Finger, which in turn is very different from Carpal Tunnel Syndrome. However, what these so-called 'Type 1' RSIs do have in common is that they're all recognised medical conditions, and they can all be diagnosed using standard clinical techniques. 'Type 2' RSIs aren't, and can't.

Type 2 RSI – also called 'diffuse RSI', or 'Non-Specific Pain Syndrome' – refers to pain that may move around, and which can't easily be diagnosed. It's one of the most common kinds of RSI, but it's often dismissed as 'all in the mind'; as a result, sufferers often find that their employers, GPs and even their colleagues don't take them seriously. Although such conditions don't preclude people from suing for compensation – in 2001, Plymouth County Court ruled that while a claimant had "no physical signs" of injury, it was clear that an injury had been suffered; the claimant was awarded £87,000 – the RSI Association notes that attitudes towards Type 2 RSI lead to "a great deal of distress among those afflicted with the condition who have been dismissed as being 'hysterical'".

The controversy over RSI is all the more confusing because it's hardly a new development: RSIs affected scribes in the 18th century, mill workers in the 19th century and production line workers in the last century. Many RSIs are industrial – Vibration White Finger affects users of power tools, Trigger Finger is an occupational hazard for riveters – and as the name suggests, Tennis Elbow affects sportsmen and women. However, as we've ditched typewriters for PCs and computerised more jobs, the number of RSI sufferers in computing and clerical roles has increased. A recent survey by the Health and

Safe as mice

Equipment that can reduce the risk – or pain – of RSI

www.ergotype.nl

It may look like a Salvador Dali painting, but the SafeType keyboard is built on sound science. Unlike normal keyboards, which require you to twist your arms into an unnatural position, the SafeType's vertical design – which retains the standard QWERTY key layout – is much more comfortable, although if you can't touch type you should expect a steep learning curve. The SafeType costs around £250.



www.hermanmiller.com

The Rolls-Royce of ergonomic chairs is widely regarded as the most comfortable chair you can buy, although with prices ranging from £500 to nearly £1,000 it's hardly cheap. Less expensive ergonomic chairs are widely available: look for chairs with adequate back and seat support, height adjustment and adjustable lumbar support.

➔ Safety Executive found that 506,000 UK workers suffered from a work-related upper limb or neck disorder, and that figure may be the tip of a very painful iceberg.

Risky business

RSI is often seen as the result of too much typing, but using a keyboard and mouse doesn't mean you'll suffer an injury. There are five key causes of RSI: repetitive movements, forceful movements, physical stresses, static or uncomfortable posture, and vibration.

These five factors explain why some computer users develop RSI, while other users who may work in the same

location, doing the same job remain pain-free. Repeating the same movements again and again for long periods of time is certainly a risk factor, but if you also hit the computer keys with excessive force and maintain the same posture for long periods of time without a break – especially if that posture is bad posture – then your risk of RSI increases dramatically.

Stress is a factor, too. People who work in high-pressure environments with little job security may take fewer breaks and work longer hours than people with less stressful jobs; the long hours culture is also endemic among self-employed people and people on short-term or

Healing hands

Fighting back against RSI



Don't ignore the symptoms. Physiotherapy and alternative therapies can be very effective.

RSI is often viewed as incurable, but treatment – and changing your behaviour – can reduce the symptoms. Avoiding the tasks that caused your RSI in the first place – whether that's computer work, tennis or gardening – is sensible, and you should avoid using painkillers to mask the pain. If you do that, you're continuing to damage your body and make your RSI even worse – and when the painkillers wear off, you will be in agony.

David Ruegg (<http://home.clara.net/ruegg>) is the author of 'Repetitive Strain Injury: A Handbook on Prevention and Recovery' (ISBN 0-9534718-0-2): "Getting better is a long term process – it's not something that happens overnight," he says. "[but] the best thing to do with RSI is to sort it out as soon as you can."

Many RSI sufferers find that doctors do little more than prescribe painkillers

and, if they're lucky, physiotherapy. "There isn't really any sort of facility for treatment [in the NHS]," Ruegg suggests. "Doctors and particularly consultants don't see it as a serious problem, because it isn't life threatening – and a particular treatment may not be right for every person. Physiotherapy can be quite good; some people find acupuncture is helpful; there's the Alexander Technique, Pilates, gentle exercise, stretching... the healthcare system isn't really set up for that."

Some sufferers report good results from supplements such as Glucosamine Sulphate, others by trying acupuncture and still others from deep massage. Many of the RSI sufferers we spoke to found that alternative therapies such as the Bowen Technique helped, although of course other sufferers felt that such treatments were expensive and unsuccessful. Of the various treatments

tried by RSI sufferers, two seem to have been particularly effective: physiotherapy and the Alexander Technique. Sufferers report that in particular, physiotherapists specialising in sports injuries can make a real difference, and you'll often find such therapists working in, affiliated to or advertising in local health clubs.

The Alexander Technique is more controversial: some sufferers dismiss it as "tree-hugging mumbo-jumbo" while others sing its praises from the rooftops. The technique focuses on improving posture and reducing stress, and its adherents – of whom there are many – point out that poor posture and excessive stress are contributing factors in many cases of RSI. More information and local contact details are available from the Society of Teachers of the Alexander Technique website (www.stat.org.uk). ■



www.asd.co.uk
www.griffintechology.com

The combination of a laptop stand and a separate keyboard makes your portable PC much less likely to damage your health. Such stands are widely available from manufacturers such as Lapup and Griffin; although it's designed for Apple's iBook and PowerBook, Griffin's iCurve stand is also particularly good for small form factor PC notebooks.



www.ergotype.nl

The Quill Mouse takes a standard two-button mouse and turns it sideways, enabling you to control the mouse while keeping your arm in a more natural, 'handshake' position. It isn't cheap – expect to pay around £70, but users claim that it really does help their RSI.

fixed-term contracts, who may eschew breaks and work through the night in order to meet deadlines.

Another reason why these high-pressure environments are risky is that they often involve little variety. Someone employed to do data entry or programming will spend most, if not all, of their working hours using a computer, whereas someone in an administrative job may alternate between computer work, paperwork and so on.

One of the key reasons why some people contract RSI and others don't is posture. Bad posture can be the result of inadequate ergonomics, such as an uncomfortable chair and a desk that's too high, or it can be self-inflicted: for example, many people rest the weight of their arm on the heel of their hand while using the mouse, a habit that can easily lead to crippling pain. In some cases it's both: users who are unaware of the risk of RSI may not realise that their working environment is dangerous. We've seen computer setups that beggar belief: for example, a designer in a DIY firm whose computer monitor was mounted on the wall, two feet above head height and at an angle of 45 degrees from the keyboard. Even though computer use was only a small part of that person's job, the ridiculous placement of computer equipment was already causing severe neck and shoulder pains.

Correct computing posture is all about right angles. Your feet should be flat on the floor, with your calves vertical and your thighs horizontal; your back should be upright and your monitor placed directly in front of you with the top of the screen at head height. Your arms should also be at right angles: your upper arms vertical, and your forearms horizontal. Resting your wrists on the desk as you type is a no-no, and some ergonomics experts suggest that the use of wrist rests is equally dangerous.

Correct posture is easy enough with a desktop, but what about laptops? Their design means that correct posture is almost impossible – if the screen is at the right height, the typing position is abysmal – so if you intend to use a laptop for long periods, it's sensible to put it on a stand and use a separate keyboard and mouse. You should also pay close attention to your working

environment to identify and address any potential dangers. For example if you have to refer to printed documentation, constantly shifting your gaze from monitor to desk can cause neck and shoulder strain – strain that can be prevented with a £25 document holder.

Finally, you should take lots of breaks. No matter how safe your working environment, long periods of uninterrupted computer use can still cause damage. Taking a few quick breaks during each hour of computer use can dramatically reduce this damage, which means you're less likely to end up taking a permanent break from computer work.

Living with RSI

Paul Vinnell contracted RSI through his work as a journalist. "I thought it would not happen to me," he says. "I have not been ill since I was seven, and to this day I have had just one sick day in 10 years of working life – and I'm physically very fit."

Vinnell has Type 2 RSI and while it doesn't prevent him from working, he has had to make lots of changes. "I have changed my work routine, taking mini-breaks every 20 minutes or so to stretch all parts of my upper body," he says. "I have to hot-desk, so I make sure that my desk is set up properly before I do anything."

While Vinnell's employer has been supportive, many RSI sufferers aren't as lucky. Judy Evans contracted Tenosynovitis while working as a college lecturer, and after five years of "trying to cope with no help at work" took early retirement because of the pain. "My RSI is still there," she says. "I get very tired, I drop things, I cannot write by hand... [but] because I left my job I don't think I am in as much pain as some people with RSI."

Jean Maben first noticed symptoms of RSI in late 2000, and was diagnosed as having Tendinitis. "My GP said it was unlikely that I would recover, and that it was work-related," she recalls. "She actually wrote a letter to my employers telling them that." Although Maben's employer was supportive, getting the firm to take action was more problematic. "My manager [said] all the right things," ➔

GET LISTED

One of the cruel ironies of RSI is that the best RSI resource is a busy email list: the RSI-UK list (www.rsi-uk.org.uk), which benefits from the combined wisdom of ergonomics experts, RSI sufferers and interested observers. Discussions range from difficulties with employers to the success of specific treatments (both mainstream and alternative), and while the list can be rather busy you can subscribe to a daily digest version if the volume of mail overwhelms your inbox. It's particularly good if you use Google's Gmail service, which organises messages into conversations so you don't need to scroll through topics you're not interested in.

FURTHER READING

Worksafe UK
(www.worksafeuk.com)
Worksafe UK provides advice for employers, with particular reference to the Display Screen Equipment regulations. The firm's site is a good source of information on current Health and Safety legislation.

RSI Association
(www.rsi.org.uk)
Financial troubles mean that the RSI Association is no longer trading, but its Web site is still an excellent source of RSI information.

The Typing Injury FAQ
(www.tifaq.org)
The Typing Injury FAQ is another excellent source of information on RSI, ergonomics and equipment for RSI sufferers.

Integrated Ergonomics
(www.integratedergonomics.com)
This specialist consultancy offers a range of articles on ergonomics and injuries, and also provides advice about suitable equipment available for RSI sufferers.

Maben explains. "But it took her months to arrange a workstation assessment and then more months to put into effect what had been recommended." Maben's RSI continued to get worse, and she has been on sick leave since August 2002; despite multiple cortisone injections and even surgery her condition hasn't improved. "I tried rest when I first signed off work – things improved for a while, but as soon as I go back to doing even little things, the pain returns," she says. Her employer's attitude has hardened, too. "I have had some dire meetings with my employers – really brutal ones, where I've been accused of lying," Maben says. With the support of her trades union, she is now suing her employer.

Tina Sentner works in customer services for a large data processing firm. "I started getting shoulder pains in 2002, but I didn't know anything about RSI," she says. "The company's Health and Safety people recommended a higher desk and an ergonomic keyboard, but nothing happened for one year. In March 2003 I developed problems in my arms – I was doing a lot of overtime, and we have a lot of targets to meet. I stopped typing with my left arm and used my right arm, but after a couple of weeks the pain started in my right arm [too]. A few weeks later I woke up with numb hands."

The RSI began to affect Sentner's personal life. "I couldn't wash my hair [without pain], I couldn't open containers, I had problems just brushing my teeth," she says. "I could barely open the fridge or lift a pint of milk... a friend took me away on holiday and I couldn't take off my t-shirt when I was getting changed to go out in the evening." Her employer's occupational health specialist told her that the RSI was all in her mind, but Sentner's GP signed her off work for four months and said that she should no longer work with computers.

On her return to work Sentner was given training duties, but after a few months was transferred back to her old job. Unsurprisingly, her RSI returned with a vengeance. She continued to ask for better ergonomic equipment or voice recognition software without success, and continued to work long hours during which keyboard breaks (other than the morning and afternoon tea breaks) were not allowed. As her RSI worsened she began to investigate the possibility of compensation for industrial injury, at which point her employer took action: according to Sentner, she was asked to sign a disclaimer that said her RSI was her own fault and absolved her employer of any responsibility. When she refused to sign the document, she was sent home.

Sentner is now awaiting the results of an investigation into whether her RSI exists, or whether she should be dismissed for excessive sick leave. One of the investigators

is the same occupational health specialist who dismissed her claims of RSI in 2003.

Protect yourself

Unsafe working environments should be a thing of the past: the Health And Safety (Display Screen Equipment) regulations came into force in 1992. However, the DSE regulations don't have a direct effect on RSI: it's not the equipment that causes the injury, but the way you use it. That said, the risks of RSI would be reduced if employers actually followed the DSE regulations in the first place. As Nigel Coster of DSE consultancy Worksafe UK (www.worksafeuk.com) points out, "In England, only 39 per cent of employers have actually done anything about it. That's after twelve years of the regulations being enforced."

Coster says that part of the problem is that the regulations haven't been publicised particularly well, but he's also encountered some alarming attitudes among employers: "You would be staggered by what people tell me: 'I know about the regulations, I know computers can make people ill, but I'm not prepared to do anything about it'... Research in America has shown that the money you spend on prevention saves you seventeen times that amount, but they're still not interested."

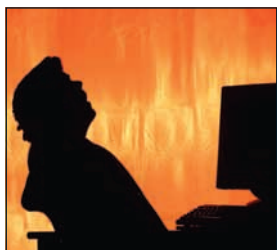
Coster does believe there's a light at the end of the tunnel, but it comes from an unlikely source: lawyers. In much the same way that fear of legal action has meant that insurers have effectively banned smoking from the workplace, the same may well happen in relation to RSI. As Coster explains, "as more people sue their employers, ultimately insurers will say 'sorry, but we're not going to insure you because you haven't taken the necessary steps.'"

Although some employers do seem to disregard the DSE regulations, RSI awareness is better than it used to be; the legal establishment also takes RSI seriously, as recent judgements – such as the award of £87,000 in damages for Type 2 RSI – demonstrate. However, people are continuing to contract RSI – and many of them will contract the condition at home.

In much the same way that the computerisation of workplaces led to an increased incidence of injury among clerical workers, many experts see the growing computerisation of our everyday lives as an RSI time bomb. Reports of children developing 'Nintendo thumb' from games consoles began to appear in the media back in 1999, and in 2003 the British Chiropractic Association warned that the growing popularity of mobile phone text messages – we sent more than 20 billion texts in 2003 – was an RSI disaster waiting to happen. As a nation, we're in love with technology – and as some of us may discover, love hurts. **PCP**

VDUs and you

Understanding the Display Screen Regulations



Know your rights: if you haven't had a risk assessment on your computer workstation then ask your employer for one.

The Health And Safety (Display Screen Equipment) regulations have been part of UK Health and Safety law since 1992, and it sets out the action employers must take to protect computer users' well-being. In particular, employers must:

- Provide adequate training and information
- Provide proper breaks or changes of activity
- Provide work stations that meet minimum standards
- Provide free eye tests if employees require them

In practice, that means employers should conduct risk assessments of computer users' workstations to identify risks such as inadequate placement of monitors and keyboards, and to provide any equipment – such as suitable chairs – to minimise the risks to the employee.

The Regulations also apply to any employees who work from home, and to self-employed users who work on the company's premises; notebook computers are also covered by the Regulations, if they are defined as being in "prolonged use".

Although it's important to keep within the law (not least because if an RSI sufferer can prove negligence, their employer could be liable for a hefty compensation payment), the main reason employers should act to reduce RSI risks is economic. RSI can affect both productivity and attendance: according to the TUC, RSI sufferers took 5.4 million sick days in 2003 alone.

A full copy of the 1992 regulations can be found at www.legislation.hmso.gov.uk/si/si1992/Uksi_19922792_en_1.htm. ■

PCPlus HARDWARE LAB TEST

→ 16 cameras and camcorders get a close-up



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Mju 410

**Editor's Choice**

Our top award for products that combine exceptional performance and quality with superb value for money

**Performance Award**

Awarded to products that excel in our performance and quality tests, where money is less important

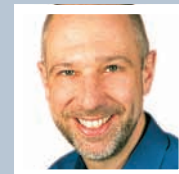
**Value Award**

Awarded to products that represent outstanding value for money, giving you more bangs per buck



James Morris
j@tzero.co.uk

James Morris has been shooting and editing video with computers for over a decade, from making music promos to documentaries and video art



Matthew Richards
matthew.richards@futurenet.co.uk

A keen stills snapper for almost his entire life, Matthew Richards inherited the passion (and a fair range of skills) for photography from his father

Capturing the moment

This month: digital still cameras that can take video clips meet digital camcorders that can snap still pictures. Can one device really do it all?

Digital cameras have become much more than just 'tiny little bits of fun', with high-resolution, great-quality output being available even from budget models. Spend a little more, however, and for around £250 you can expect a wealth of features, including a good optical zoom lens, multiple exposure and focus modes, and all the associated trickery to let you take total control of your shooting.

Digital camcorders have also reached a turning point. Megapixel DV models now

boast still image quality that is a match for low-end and pocket digital cameras. In the case of a couple of the models this month, the quality is certainly good enough for printing, and this could well make you think twice about taking a separate camera on a trip, unless you are a photography enthusiast.

So this month's test has been devised to see whether one device can really take both quality video and superb still images. 11 cameras and 5 camcorders face-off for the PC Plus prizes.



Nikon
CoolPix 4100



Pentax
Optio S40



Sony CyberShot
DSC-P73



Canon
MVX25i



Canon
MVX250i



JVC
GR-DVP9EK



Panasonic
NVGS200B



Sony DCR-
PC109E

How we tested

To test a camera properly, you've got to shoot a variety of subjects under different lighting conditions

There can be a world of difference between how good a camera looks on paper and how those specifications translate into real life photography. Of special concern are overall lens sharpness and distortion, colour rendition, white balance, accuracy of exposure and focusing, and grain which, unlike 'real' grain in film photography, is video noise in the image sensor which can increase dramatically with higher ISO speeds.

Each of the cameras was tested first and foremost for its stills performance. A wide range of subjects were used, starting with natural landscape and architecture photography and portraiture for checking all-important skin tone rendition. Vivid colour reproduction was tested by photographing brightly coloured flowers and painted models, both in natural light and using indoor built-in flash. Throughout all the test

shots, the accuracy of the exposure and auto-focus functions was checked.

Switching to movie capture, the cameras were tested for their ability to maintain focus and react quickly to changes in subject distance from the lens, as well as maintaining focus through zoom adjustments. The overall quality of movie clips was checked by copying the files to the PC and viewing them on screen, complete with soundtrack.

Of particular note is that the cameras use different video formats for video clip capture. Some of the newest models use MPEG video recording, as opposed to less impressive AVI or QuickTime Motion JPEG video standards. The maximum pixel sizes of video clips also vary, between 320x240 pixels and 640x480 pixels, the latter being large enough for viewing full screen on a standard television set. The final major

factor in video quality is the frame rate: the more advanced cameras enable a broadcast quality frame rate of 24fps (frames per second) while others only manage a relatively jerky 10 or 15fps.



Flowers tested a camera's vivid colour reproduction.

CANON PowerShot S50

INFORMATION

PRICE £249 (£212 ex VAT)

SUPPLIER Canon 0870 514 3723

INFO www.canon.co.uk

WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

CANON POWERSHOT S50

Value ○○○○○○○○○○○○

Features ○○○○○○○○○○

Performance ○○○○○○○○○○

OVERALL 8

It's a sign of the times and the general miniaturisation of digital cameras that the PowerShot S50 is starting to look a bit on the chunky side, especially compared with some of Canon's own Ixus range. However, the generous proportions do at least allow for a large range of control buttons, which sprout from the top and back of the camera. Considering the S50's excellent range of auto and manual focus and exposure modes, this is a good thing as buttons have few shared functions between them, making for more intuitive operation once you remember where they all are.

One criticism is that the buttons are not conveniently placed, especially the zoom button, which is awkwardly mounted on the front edge of the top,

rather than a more natural rear placing.

Using Canon's acclaimed nine-point AiAF auto-focus system, the S50 consistently gave sharp results in our tests, while the DiGic processor enabled natural, yet vibrant colour balance and great tonal separation in a wide variety of shooting conditions. In short, the overall picture quality of the S50 is good, especially at the slowest speed rating of 50 ISO, although results can get a little grainy at higher speeds.

Video capture is limited to three-minute clips, which is quite generous



compared with some of the cameras on test. The maximum 320x240 pixel size and 15fps frame rate in AVI format are adequate for most uses, but you can't operate the zoom control while shooting a video clip, which limits the flexibility. It's a camera that really is best suited to stills.

CASIO QV-R41

INFORMATION

PRICE £249 (£212 ex VAT)

SUPPLIER Casio 020 8208 7838

INFO www.casio.com

WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

CASIO QV-R41

Value ○○○○○○○○○○

Features ○○○○○○○○○○

Performance ○○○○○○○○○○

OVERALL 7

Renowned for its credit card-sized Exilim sub-compact digital cameras, Casio's new QV-R41 is quite large by the company's own standards, although the camera is still one of the smallest on test. It also has a neat and tidy layout, with only a few essential buttons to clutter up its clean lines. The back of the camera features a larger than average two-inch LCD screen, which makes life easier for composing shots when not using the optical viewfinder and for reviewing them.

The QV-R41 won't find favour with more 'serious' photographers, because it has a distinct lack of manual override options for aperture and shutter settings. What it does have, however, is a huge range of scene modes, including Portrait, Scenery, Coupling,

Children, Candlelight, Party, Flower and Pet; to name but a few.

Better still, each mode has a sample photo on the LCD screen, with a text display to tell you what the camera is aiming for in terms of colour balance, shutter speed, aperture and so on. Flash modes and the choice of auto or manual focus are rather easier to set up, thanks to the thumb pad on the back of the camera.

The menu system is very self-explanatory and easy to understand and it's here that you can swap from stills photography to movie capture.



Like the Canon S50, the Casio model uses the AVI video format for 320x240 pixel movie clips, recorded at 15fps. Sadly, the maximum recording time is just one minute but, on the plus side, the zoom button works during video recording mode, adding to the camera's all-round capabilities.

FUJIFILM FinePix A340

INFORMATION

PRICE £179 (£152 ex VAT)
SUPPLIER Fujifilm 020 7586 1477
INFO www.fujifilm.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

FUJIFILM FINEPIX A340

Value: ●●●●●●●●●●
 Features: ●●●●●●●●●●
 Performance: ●●●●●●●●●●
OVERALL 6

The overall build quality of the new Fujifilm FinePix A340 isn't quite a match for some of the other cameras on test, but it's easy to forgive the slightly plasticky feel when you consider that it costs £100 less than the likes of the Kodak, Olympus and Minolta. What the A340 does do with some style is to provide you with a basic point and shoot camera, complete with 3x zoom lens and 4Mp sensor that mostly manages to get its settings right automatically. Sure enough, it's possible to trick the exposure readings in particularly difficult lighting conditions but one manual nicety is the EV compensation control so you can bring things back to rights, viewing the subject through the LCD panel to keep an eye on exposure.

Continuing the simplicity theme, there are remarkably few buttons on the whole camera and the extra-friendly menu system is particularly well thought out to make the A340 intuitive to use. With its 4Mp sensor, there's quite a lot of definition to be had in still photographs although the overall sharpness and colour balance isn't on a par with some of the other cameras on test this month.

In movie mode, things don't get any better. A typical 320x240 resolution makes for moderate-sized movie clips, but you're limited to a single minute of



shooting and, worse still, the reproduction is decidedly jerky at a frame rate of only 10fps. Adding insult to injury, there's no audio capture facility, although at least you can zoom while recording. All-in-all, the Fujifilm is still good value at the price, but it just doesn't match up to others in the test.

HP Photosmart R707

INFORMATION

PRICE £249 (£212 ex VAT)
SUPPLIER HP 0870 010 4320
INFO www.hp.com/uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

HP PHOTOSMART R707

Value: ●●●●●●●●●●
 Features: ●●●●●●●●●●
 Performance: ●●●●●●●●●●
OVERALL 7

As small and neat as the best cameras here, HP's new Photosmart R707 also boasts a rugged build quality. The back panel styling is also particularly good, with a neat arrangement of control buttons that are both simple and intuitive to use. The menu system follows suit, with a wide range of automatic and manual settings easily available, plus a good selection of scene modes that bring great results within the reach of technically challenged photographers.

Picture quality for still photos is superb in almost all conditions, even in fully automatic mode. When things get tricky, you can adjust contrast, saturation levels, and ISO speeds manually if you feel the need. You can opt for different centre-weighted or spot metering and

the normal 'average' metering mode.

Geared up for movie capture as well as stills, the R707 is one of a small minority of cameras on test to feature the MPEG-1 video format. There's also a separate movie capture button, as well as the regular shutter release, which is nice as you don't have to switch between capture modes before shooting either still images or movies. However, you do have to be a bit careful not to press the wrong button when going for the shot. The only real niggle with the R707's otherwise high quality, 30fps video



abilities is that you can't use the zoom lens while in movie mode, which does spoil things somewhat.

So long as you can live with this, the R707 offers good quality at the price and has a handy range of accessories, including a fast charger and Kodak-style docking station.

KODAK EasyShare DX7440

INFORMATION

PRICE £299 (£254 ex VAT)
SUPPLIER Kodak 0870 243 0270
INFO www.kodak.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

KODAK EASYSHARE DX7440

Value: ●●●●●●●●●●
 Features: ●●●●●●●●●●
 Performance: ●●●●●●●●●●
OVERALL 7

The 'EasyShare' moniker for most of Kodak's compact digital cameras relates to their docking stations, which let you charge up your camera batteries and copy photos to your PC, or printer docks that work on a similar basis for producing dye-sub colour prints. Unfortunately, these things do not come as standard accessories with the DX7440.

The DX7440's 4Mp image sensor is fed by a 3x optical zoom Schneider-Kreuznach Variogon lens, which performs excellently. All the still photos we took were crisp and sharp, and the camera seemed to handle focusing in highly gloomy indoor conditions very well, even without a focus-assist beam. Results also tended to have good natural colour and solid tonal balance.

For control, there's a wide range of options including aperture and shutter-priority modes, fully manual and the usual fully automatic and Program AE modes. Access to these and setting parameters can be a bit fiddly, however, relying on two dials, one of which has an additional, central four-way button control while the other requires pushing or rotating for specific options. It sounds complex and, to begin with, it is, but it soon becomes second nature.

Switching to video capture, the DX7440 uses the QuickTime format but



still manages a big 640x480, full VGA maximum size, with frame rates of either 13 or 24fps. This makes for good, clear video footage but, again, the Kodak won't let you use the zoom feature in video mode. Overall, however, the Kodak EasyShare DX7440 is a decent buy at the price.

KONICA Minolta Z2

INFORMATION

PRICE £299 (£254 ex VAT)
SUPPLIER Minolta 020 8751 6121
INFO www.minolta.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

KONICA MINOLTA Z2

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	10

There's always one camera that feels the need to show off and in this group it's the Konica Minolta Z2. Building on the success of the company's acclaimed Z1 camera, the Z2 looks identical, but features a 4Mp sensor (in place of a 3Mp CCD) and an upgraded Minolta GT lens. The same enormous 38-380mm 10x optical zoom range remains, however, putting the competition's paltry 3x zoom lenses in the shade.

As a stills camera, the Z2 is simplicity itself to operate in Auto mode. However, it also has a full range of program, aperture-priority, shutter-priority, metered manual and various scene modes available as well. In all, it's a great choice for novices who desire a camera that will grow as their

abilities develop, or for experts who demand more control over their photography.

The Z2's picture quality is exceptional for still images, especially at the lower end of the ISO range where there's almost no trace of grain. Subtle and vibrant colours are equally well reproduced and the sharpness was also excellent throughout all our test shots.

Moving into video, the Z2 not only features 640x480 pixel capture at 30fps, but also has a world-first for a stills camera in the shape of 800x600 SVGA resolution, even if you do need to drop

down to 15fps in this mode. You can make use of that powerful zoom lens in video capture and there's no time limit on video clips, so you can just keep shooting until your memory runs out. All things considered, the Z2 is almost impossible to fault and, at the price, it's a real bargain buy as well.



KYOCERA FineCam S3R

INFORMATION

PRICE £229 (£195 ex VAT)
SUPPLIER Kyocera Yashica 01189 33 7000
INFO www.kyocera.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

KYOCERA FINECAM S3R

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	9

The FineCam S3R boasts Kyocera's award-winning RTUNE image processor (hence the 'R' in the camera's name). This high-speed system enables continuous stills shooting, rather than burst mode, at up to 3.1 frames per second, so even sequenced still photographs have an almost movie-like feel to them.

The camera itself is small and neat but feels high quality with its full metal jacket made of smartly finished aluminium. Our only gripes are that the four-way, push-in menu paddle takes some getting used to, and the pop-up flash 'pops up' even when you don't need it – as soon as you turn the camera on, in fact.

The Kyocera created excellent quality images in all test conditions.

Purists might not like the rudimentary aperture priority mode (you can choose only F2.8 or F9.6) being the only diversion from full Program mode. However, there are five scene modes to choose from, which gives more scope. Like all other settings, scene modes are easy to get at thanks to a simple interface and button layout.

In movie mode, you get a great choice of options. Image size is selectable between 160x120, 320x240 and 640x480 pixels, each of which can be run in 15 or 30fps. Further video options include various colour modes,

white balance presets, spot, wide or manual focusing and even a delay-timer. The camera is well thought out – you record movie clips without a time limit (i.e. until the memory card is full), and use both optical and digital zoom in videos, which makes this a great crossover camera for the price.



OLYMPUS Mju 410

INFORMATION

PRICE £279 (£237 ex VAT)
SUPPLIER Olympus 020 7253 2772
INFO www.olympus.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

OLYMPUS MJU 410

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	6

The minimalist design of the Mju 410 enables a slimline package that's easy to slip into a pocket. The trade off is that the simple button layout has to double up on a range of functions, making the finer points of operation quite tricky, especially when it comes to using the rotating mode selection icons on the screen.

For pure picture quality, Olympus compact digital cameras usually have a natural look about them and the Mju 410 is no exception. This makes it ideal for landscape photography and portraiture, although the more vivid colours tend to be a little muted.

The trademark Olympus slide-over lens cap, which also turns the camera on and off is very much in evidence and protects the flash unit and

viewfinder as well as the main 3x zoom lens when it's closed. After a surprisingly noisy start-up, with trill sound effects and a loudly whirring servo motor, the Mju 410 is noticeably quiet in operation, with an all but silent optical zoom lens motor. This is great news for video capture as the noise of the zoom doesn't get picked up by the camera's microphone.

Further video niceties include the option to record at either 160x120 pixels or 320x240 pixels but, again, the confusing interface and doubling up on button functions means that getting

the right menu screen you need can be tricky. The frame rate is fixed at a far from impressive 13fps and the maximum video clip length is 90 seconds, making the Mju 410 a better bet for simple, straightforward stills photography rather than a combined stills and video capture device.



NIKON CoolPix 4100

INFORMATION

PRICE £249 (£212 ex VAT)
SUPPLIER Nikon 020 8541 4440
INFO www.nikon.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

NIKON COOLPIX 4100

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 8

Many people think that, when it comes to digital cameras, companies with a photographic heritage, rather than an electronics background, usually produce the best kit. The Nikon CoolPix 4100 certainly adds weight to this argument as this compact model is a great tool for casual snappers and serious photographers alike.

There are few frills on this camera. For example, apart from the wide range of different scene modes, there's no aperture or shutter priority exposure mode, and you can forget about manual override. However, the Nikon excels at picking the right exposure and focus settings in an amazingly wide range of shooting conditions. It translates this into excellent picture

quality in terms of colour rendition, tonal separation, sharpness and all-round brilliance. It does all this with minimal fuss, by providing the photographer with easy control buttons and menu system. And that, after all, is what most of us want from a compact camera.

In video recording mode, the Nikon offers a range of image sizes, from 160x120, through 320x240 up to a maximum of 640x480 pixels. All sizes are recorded at 15fps and stored in the QuickTime MOV format. As with still pictures, the quality is excellent,



although the CoolPix does suffer a little more than some from the microphone picking up on focus adjustments. Nikon actually suggests pre-focusing the camera and locking the focus during video shooting. Overall, the CoolPix 4100 is a simple but highly effective, quality camera.

PENTAX Optio S40

INFORMATION

PRICE £249 (£212 ex VAT)
SUPPLIER Pentax 01753 79 2792
INFO www.pentax.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

PENTAX OPTIO S40

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 9

For pure style, the Pentax Optio S range is a real winner. In fact, it won the coveted annual 'Gadget of the Year' award for 2003, in our sister publication 'T3', who described the camera as a "design classic". More than just cute aluminium eye candy, its design combines functional ease of use with a wide range of great features and squeezes them all into the smallest camera in the group.

In spite of diminutive size, the S40 manages to fit in a mode wheel on the top of the case, which provides instant access to all the main shooting and review modes. This is backed up by a simple menu system and interface. It's easy to select and adjust the settings without too much messing around, so you won't miss a good shot.

Like the Nikon CoolPix 4100, there's not much in the way of manual controls, but at least you get Program as well as a fully automatic shooting mode and the usual selection of scene modes for tricky conditions. However, the Pentax works best as a simple point-and-shoot camera, managing to guess the right settings time after time, just like the Nikon, and delivering spectacular results in terms of sharpness, exposure and overall image quality.

Movie mode isn't quite as accomplished, with a maximum-



recorded image size of 320x240 pixels. However, you do get a slick frame rate of 30fps and the luxury of being able to shoot until you reach memory capacity.

All things considered, the Pentax is a great choice for anyone who wants top results and real flexibility from the tiniest of cameras.

SONY CyberShot DSC-P73

INFORMATION

PRICE £249 (£212 ex VAT)
SUPPLIER Sony 020 7365 2934
INFO www.sony.co.uk
WARRANTY One year

REQUIREMENTS

OS Windows 98 or higher

PCPlus ratings

SONY CYBERSHOT DSC-P73

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 7

The first thing that you notice about the Sony CyberShot DSC-P73 is that it sounds dreadful. Almost every button press is accompanied by the most annoying squawks, beeps and mini-melodies that you can imagine. Once you learn how to turn these off, the Sony becomes a rather nice little camera.

Like many CyberShots in the past, it's longer than most digital cameras but sits comfortably in the hand and features a good compromise between having enough buttons to simplify operation and giving you an uncluttered panel layout.

The Sony is opposite to the Olympus Mju 410 when it comes to colour rendition. Whereas the Olympus is natural but slightly muted, the Sony

tends to be great for vivid colours, but overly strident for flesh tones. Overall, however, still pictures were of extremely good quality without any unwanted image attributes.

With a longer history in camcorders than stills cameras, you'd expect the Sony to be good for video capture and, indeed, it is. As well as 320x240 and 640x480 image size options, you also get a 'high-quality' 640x480 mode, which really makes the most of the camera's MPEG-1 video format capabilities (Sony Memory Stick Pro cards must be used to access this



mode). You can also shoot unlimited length video clips until the memory runs out. The only drawbacks are that the frame rate is a second-best 15fps and you can't use the zoom feature in video recording. Apart from this, the DSC-P73 is a capable camera for both stills and video.

How we tested

Manual mode, auto-mode, indoors-outdoors and shake it all about...

We put the five camcorders through a variety of tests both indoors and out. We started by leaving the cameras in auto mode, so that exposure, focus, white balance, and shutter were determined by the camcorder. For the casual user, good performance without manual setup is vital. We experimented with manual white balancing, exposure and shutter. We also invoked manual focus when testing without camera moves, which was primarily during the indoor tests.

As it's a standard TV format, DV uses an interlaced frame rather than the progressive scanning of the computerised world, so it can be prone to artefacts, particularly when faced with diagonal lines. We made sure that such 'problem objects' were included in our tests. We also simulated mild vibration to see how the image stabilisation performed. Cheaper camcorders can

encounter difficulties is resolving the outlines of colour objects in low light, so we included plenty of these in our artificial light tests, too.

Like digital cameras, single-chip camcorders only capture their full resolution in monochrome. The colour signal is made up by filtering the light, so that different CCD pixels pick up a different colour. A block of four CCD pixels is used to interpolate the colour of each output pixel, so colour resolution is less than monochrome. Therefore, unusual lighting conditions cause trouble for the interpolation system – colours spill over the edges of objects.

Three-chip camcorders don't have this problem, as the light is split by a prism and directed to three full-resolution CCDs, one for each of the three colour signals. This means that units like the Panasonic NVGS200B this month have colour resolution identical to their monochrome

resolution, so should offer much better chromatic detail in all lighting conditions. This is one area where Megapixel CCDs don't help, as the extra resolution is only called into play for still images.



We tested each DV cam in bright, sunny conditions.

CANON MVX25i

INFORMATION

PRICE £725 (£617 ex VAT)

SUPPLIER Direct www.prcdirect.co.uk
0870 777 2323

INFO www.canon.co.uk

WARRANTY One year

PCPlus ratings

CANON MVX25i

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	9

The new flagship of Canon's MVX range scarcely puts a foot wrong. The single CCD is a 1/3.4in sensor, the largest this month. This offers better light sensitivity than other camcorders on test. It also sports a 2.23 Megapixel resolution, for stills up to 1,632x1,224.

Video performance was very good, both indoors and out, but colour fidelity couldn't match Panasonic's NVGS200B (page 97) in sunlight. Under artificial light, the MVX25i registered colour as accurately as the Panasonic, but contrast and detail were slightly inferior.

Although the MVX25i couldn't live up to the Panasonic NVGS200B's trio of CCDs when shooting video, three CCDs don't provide any benefit for still images. The Panasonic's native resolution may be marginally higher

than the Canon's, but the latter uses considerably less compression at its top quality setting. The result is still images with noticeably better detail. If your photography is as important as your video, the MVX25i is the clear winner.

It's also fully stacked with features. Every setting can be manually controlled, including audio – the only one with this ability in the test. Manual focus operates via a lens ring; exposure and shutter control are also available. To round it all off, the tape mechanism is top loading.



Unfortunately, the MVX25i's complete feature set comes at a price. It's also the heaviest camcorder on test, although not by enough to be a strain. But neither of these should be a deterrent. If you want the best stills, top quality video, and full manual control, Canon's MVX25i should be top of your list.

CANON MVX250i

INFORMATION

PRICE £599 (£510 ex VAT)

SUPPLIER Ask Direct
www.askdirect.co.uk 020 7307 8321

INFO www.canon.co.uk

WARRANTY One year

PCPlus ratings

CANON MVX250i

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

Canon's MVX range has traditionally been its premium single-chip offering, but the new 200 series spells a slight change of direction. This is still not a budget camcorder, but it's much cheaper than MVX models used to be.

Like its MVX25i stablemate, the MVX250i has a larger CCD than is usually found at this level – 1/4.5in. However, it's only a 1.33 Megapixel model, so still images are limited to 1,280x960 pixels. The larger CCD certainly showed its calibre in our video tests, with very good colour performance both indoors and out. However, the vibrancy exhibited by the top two models was lacking, as you'd expect for a cheaper camcorder.

For still images, the MVX250i was constrained by the lower resolution of

its CCD. Performance was better than JVC's GR-DVP9EK, which has an identical resolution CCD. But printing images on standard 6x4in paper is unlikely to give good results.

The MVX250i is still a very good camcorder for the money, though. It has a top-loading tape mechanism, so you can easily use it with a tripod. There's an accessory shoe for attaching an external video light or microphone, with a mini-jack provided for hooking up the latter.

Manual controls are well represented as well: white balance, exposure, shutter, and focus can all be

user-configured. However, while the MVX25i has a lens ring for adjusting focus, the MVX250i resorts to a more fiddly menu selection wheel. Overall, though, this is a very good camcorder for the money, but it doesn't quite combine top notch DV with printable stills.



JVC GR-DVP9EK

INFORMATION

PRICE £654 (£557 ex VAT)
SUPPLIER Ask Direct
 www.askdirect.co.uk 020 7307 8321
INFO www.jvc.co.uk
WARRANTY One year

PCPlus ratings

JVC GR-DVP9EK

Value ●●●●●●●●●●
 Features ●●●●●●●●●●
 Performance ●●●●●●●●●●
OVERALL 7

The DVP9 is one of the most original-looking camcorders around. Instead of the habitual brushed metal look, it sports a stylishly retro black plastic exterior. Unfortunately, the beauty is mostly skin deep compared to this month's competition.

On paper, the DVP9 has a decent specification. The CCD is a 1/4in model rather than the 1/5in or 1/6in units usually found at this price point. It boasts 1.33 Megapixels, and JVC uses interpolation to boost stills resolution to 1,600 by 1,200. It even has a back-loading tape mechanism.

However, the 2in LCD panel feels a little small, when every other entrant this month offers 2.5in. There's an accessory shoe, but no microphone input, although the shoe is wired for

proprietary JVC attachments. At least there's a headphone socket. You can call upon manual focus, exposure and white balancing, but they're not easy to access as the membrane buttons are fiddly. Focus in particular is very hard to operate and there's no manual shutter control; only presets among the AE modes.

The DVP9 was really let down by its image quality. In both indoor and outdoor tests, it tended to overexpose the subject matter, although this could mostly be corrected. Compared to the cheaper Sony DCR-PC109E, the JVC



failed to pick up tonal range. The image stabiliser and auto-focus performed adequately, however, even though the overexposure also severely limited stills ability.

The JVC isn't a bad camcorder. It just can't compete with others on test and its stills quality was simply outclassed.

PANASONIC NVGS200B

INFORMATION

PRICE £748 (£637 ex VAT)
SUPPLIER Ask Direct
 www.askdirect.co.uk 020 7307 8321
INFO www.panasonic.co.uk
WARRANTY One year

PCPlus ratings

PANASONIC NVGS200B

Value ●●●●●●●●●●
 Features ●●●●●●●●●●
 Performance ●●●●●●●●●●
OVERALL 9

Panasonic's NVGS200B isn't the first three-CCD camcorder to drop below £1,000. That accolade is held by its predecessor, the NVGS70B. But Panasonic is still, currently, unique in making this technology available at the same price as single-chip models.

The GS200B certainly benefits from its three chips: video performance was ahead of any other camcorder this month, although the Canon MVX25i gave it a run for its money. Colours were vibrant with a full tonal range, whatever the lighting conditions. Despite using 1/6in CCDs, performance in low light was still impressive. Our only minor criticism was a slight overburn in very brightly lit areas. The GS200B aggregates its three 800,000 pixel CCDs for stills, to make a

total of 2.32 Megapixels. This allows a resolution of 1,760x1,320. Not surprisingly, image quality was very good, sufficient to print on 6x4in paper. However, Panasonic uses too much compression, which results in an obvious JPEG grain.

Despite its small size, the GS200B also offers a fine selection of manual controls. Most are a few button clicks away. There's a manual focus lens ring, plus user-configurable white balance, exposure, and shutter. There's an accessory shoe and mini-jacks for both microphone and headphone, and the



tape loads from the top. However, it's a shame that Panasonic didn't opt for manual audio control.

If you're after the best video performance, the Panasonic NVGS200B should be your first choice. This is particularly commendable considering how small it is.

SONY DCR-PC109E

INFORMATION

PRICE £575 (£489 ex VAT)
SUPPLIER Ask Direct
 www.askdirect.co.uk 020 7307 8321
INFO www.sony.co.uk
WARRANTY One year

PCPlus ratings

SONY DCR-PC109E

Value ●●●●●●●●●●
 Features ●●●●●●●●●●
 Performance ●●●●●●●●●●
OVERALL 8

Sony's reputation with camcorders always precedes it, although some of its features, like Bluetooth networking, have had questionable uses. However, you'll rarely find Sony camcorders lacking when it comes to the most important feature – video quality.

The PC109E's video performance lived up to Sony's reputation, with accurate colours and good contrast in both sunlight and artificial illumination. Its outdoor performance was commendable. However, indoors we found shiny regions were slightly overexposed. This can be fixed by the PC109E's manual control through its LCD touch screen. It's not the only Sony camcorder to have it, but it's unique among this month's selection. Using the LCD, exposure and focus can be

controlled by an on-screen slider. But both can also be spot-controlled by touching the part of the image you want to use as a reference – very nice.

Despite its single Megapixel CCD, the Sony held up well in stills. Its 1,152x864 resolution won't be high enough for photo printing. But we found detail, contrast and colour fidelity to be good. For the camcorder enthusiast, however, the PC109E has a couple of flaws. For instance, tripod users will not appreciate the bottom loading tape mechanism. There's also no headphone socket, which is curious



considering the presence of an accessory shoe and microphone input. Still, this isn't one of Sony's semi-professional models – it's tiny and light and fits in the pocket. Considering the price, good video quality and unique spot exposure and focusing, Sony's DCR-PC109E fits the bill nicely.

Still cameras



DETAILS

Make and model	Canon PowerShot S50	Casio QV-R41	Fujifilm FinePix A340	HP photosmart R707	Kodak EasyShare DX7440	Konica Minolta Z2
Price	£249 (£212 ex VAT)	£249 (£212 ex VAT)	£179 (£152 ex VAT)	£249 (£212 ex VAT)	£299 (£254 ex VAT)	£299 (£254 ex VAT)
Supplier	Canon 0870 514 3723	Casio 020 8208 7838	Fujifilm 020 7586 1477	HP 0870 010 4320	Kodak 0870 243 0270	Minolta 020 8751 6121
Info	www.canon.co.uk	www.casio.com	www.fujifilm.co.uk	www.hp.com/uk	www.kodak.co.uk	www.minolta.co.uk
Warranty	1 year	1 year	1 year	1 year	1 year	1 year

TECHNOLOGY

Megapixels	5.0Mp	5.0Mp	4.0Mp	5.3Mp	4.0Mp	4.0Mp
Optical zoom (35mm equivalent)	3x (35-105mm)	3x (35-117mm)	3x (38-114mm)	3x (39 - 117mm)	4x (33-132mm)	10x (38-380mm)
Digital zoom	4.1x	4x	1.7x	8x	4x	4x
Video format	AVI	AVI	AVI	MPEG-1	QT Mov	QT Mov
Max video clip pixel size	320 x 240	320 x 240	320 x 240 (no sound)	320 x 240	640 x 480	800 x 600
Max video clip length	3 minutes	1 minute	1 minute	Memory card limit	Memory card limit	Memory card limit
Video frame rate	15fps	15fps	10fps	30fps	13 or 24fps	15 or 30fps
Zoom available in video mode	No	Yes	Yes	No	No	Yes
Memory type	CompactFlash	SecureDigital/MMC	xD-Picture Card	SecureDigital/MMC	SecureDigital/MMC	SecureDigital/MMC
Battery type	Rechargeable Li-ion	2 x AA	2 x AA	Rechargeable Li-ion	Rechargeable Li-ion	4 x AA

FOCUS AND EXPOSURE

Focus modes	AF & Manual	AF	AF	AF & Manual	AF	AF & Manual
Exposure modes	Au, P, AP, SP, Sc, M	P	Auto	Auto, P, AP	Au, P, AP, SP, Sc, M	Au, P, AP, SP, Sc, M
Max lens aperture	f/2.8 - f/4.9	f/2.8 - f/4.9	f/2.8 - f/4.9	f/2.8 - f/4.9	f/2.8 - f/4.8	f/2.8 - f/3.5
Max shutter speed	1/1,500 sec	1/2,000 sec	1/2,000 sec	1/2,000 sec	1/2,000 sec	1/1,000 sec

PHYSICAL

Size/Weight	112x58x42mm/260g	88x60x33mm/168g	104x62x31mm/145g	98x60x36mm/180g	100x69x40mm/224g	109x78x80mm/305g
	PCPlus verdict 8	PCPlus verdict 7	PCPlus verdict 6	PCPlus verdict 8	PCPlus verdict 7	PCPlus verdict 10

DETAILS



	Kyocera FineCam S3R	Olympus Mju 410	Nikon CoolPix 4100	Pentax Optio S40	Sony Cyber-Shot DSC-P73
Price	£229 (£195 ex VAT)	£279 (£237 ex VAT)	£249 (£212 ex VAT)	£249 (£212 ex VAT)	£249 (£212 ex VAT)
Supplier	Kyocera 01189 337 000	Olympus 020 7253 2772	Nikon 020 8541 4440	Pentax 01753 792 792	Sony 020 7365 2934
Info	www.kyocera.co.uk	www.olympus.co.uk	www.nikon.co.uk	www.pentax.co.uk	www.sony.co.uk
Warranty	1 year	1 year	1 year	1 year	1 year

TECHNOLOGY

Megapixels	3.2Mp	4Mp	4Mp	4Mp	4Mp
Optical zoom (35mm equivalent)	3x (35-105mm)	3x (35-105mm)	3x (35-105mm)	3x (35-105mm)	3x (39-117mm)
Digital zoom	2.8x	2x	4x	2.6x	6x
Video format	AVI	QT Mov	QT Mov	QT Mov	MPEG-1
Max video clip pixel size	640 x 480	320 x 240	640 x 480	320 x 240	640 x 480
Max video clip length	Memory card limit	1m 30s	Memory card limit	Memory card limit	Memory card limit
Video frame rate	15 or 30fps	13fps	15fps	30fps	15fps
Zoom available in video mode	Yes	Yes	Yes	Yes	No
Memory type	SecureDigital/MMC	xD	SecureDigital/MMC	SecureDigital/MMC	Memory Stick
Battery type	Rechargeable Li-ion	Rechargeable Li-ion	2 x AA	2 x AA	2 x AA

FOCUS AND EXPOSURE

Focus modes	AF & Manual	AF	AF	AF & Manual	AF & Preset
Exposure modes	P, AP	P, Sc	Auto, Sc	Auto, P, Sc	Auto, M, Sc
Max lens aperture	f/2.8 - f/4.8	f/3.1 - f/5.2	f/2.8 - f/4.9	f/2.8 - f/4.9	f/2.8 - f/5.2
Max shutter speed	1/2,000 sec	1/1,000 sec	1/3,000 sec	1/2,000 sec	1/1,000 sec

PHYSICAL

Size/Weight	91x57x32mm/175g	99x56x34mm/159g	88x65x38mm/140g	89x59x26mm/125g	117x54x36mm/236g
	PCPlus verdict 9	PCPlus verdict 6	PCPlus verdict 8	PCPlus verdict 9	PCPlus verdict 7

Digital video cameras

DETAILS					
Make and model	Canon MVX250i	Canon MVX25i	JVC GR-DVP9EK	Panasonic NVGS200B	Sony DCR-PC109E
Price	£599 (£510 ex VAT)	£727 (£617 ex VAT)	£654 (£557 ex VAT)	£748 (£637 ex VAT)	£575 (£489 ex VAT)
Supplier	Ask Direct 020 7307 8321	PRC Direct 0870 777 2323	Ask Direct 020 7307 832	Ask Direct 020 7307 8321	Ask Direct 020 7307 8321
Info	www.canon.co.uk	www.canon.co.uk	www.jvc.co.uk	www.panasonic.co.uk	www.sony.co.uk
Warranty	1 year	1 year	1 year	1 year	1 year
OPTICS					
Optical zoom	18x	14x	10x	10x	10x
Digital zoom	360x	280x	200x	500x	120x
CCD (megapixels)	1/4.5in (1.33)	1/3.4in (2.23)	1/4in (1.33)	3 x 1/6in (0.8 each)	1/5in (1.07)
Max stills resolution	1,280 x 960	1,632 x 1,224	1,600 x 1,200	1,760 x 1,320	1,152 x 864
CONTROLS					
Focus	Auto/Manual	Auto/Manual (lens ring)	Auto/Manual	Auto/Manual (lens ring)	Auto/Manual/Spot
White balance	Auto/Manual/Presets	Auto/Manual/Presets	Auto/Manual/Presets	Auto/Manual/Presets	Auto/Manual/Presets
Shutter	Auto/Manual	Auto/Manual	Auto	Auto/Manual	Auto
Exposure	Auto/Manual	Auto/Manual	Auto/Manual	Auto/Manual	Auto/Manual/Spot
Audio levels	Auto	Auto/Manual	Auto	Auto	Auto
Program AE modes	10	10	7	5	6
Digital effects modes	9	18	14	14	16
CONNECTIONS					
FireWire	In/Out	In/Out	In/Out	In/Out	In/ Out
Analog/USB	AV, USB, S-Video	AV, USB, S-Video	AV, USB, S-Video	AV, USB, S-Video	AV, USB, S-Video (docking station)
Microphone socket	Y	Y	N	Y	Y
Headphone socket	Y	Y	Y	Y	N
OTHER DETAILS					
LCD	2.5in	2.5in	2in	2.5in	2.5in
Shoe Attachment	Y	Y	Y	Y	Y
Tape carriage	Top	Top	Rear	Top	Bottom
Separate charger included	N	N	Y	Y	N
PHYSICAL					
Dimensions (WxHxD)	73.6x78x130.1mm	77x82x134mm	43x115x80mm	70x75x126mm	50x98x97mm
Weight without batteries	490g	585g	350g	470g	385g
PCPlus verdict 8		PCPlus verdict 9	PCPlus verdict 7	PCPlus verdict 9	PCPlus verdict 8



PCPlus Verdict

Which digital cameras excel at both stills and video shooting? We put four in the frame...



EDITOR'S CHOICE

Konica Minolta Z2

PRICE £299 (£254 ex VAT)

SUPPLIER www.minolta.co.uk

INFO Minolta 020 8751 6121

It's certainly not the prettiest camera around, but the Z2 offers fully automatic and program settings plus a full range of shooting modes suitable for beginners and experts alike, while the novel electronic eye-piece and rear panel mirror system works beautifully. Apart from its excellent image quality, it's an easy winner with its extra-long zoom lens, which has a 35mm camera equivalent of 38-380mm for long telephoto, even before the digital zoom comes into play.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10



BEST VALUE

Kyocera FineCam S3R

PRICE £229 (£195 ex VAT)

INFO www.kyocera.co.uk

SUPPLIER Kyocera Yashica 0118 933 7000

Kyocera now owns Yashica and has done the camera manufacturer's photographic heritage proud with the new FineCam S3R. Utilising Kyocera's latest RTUNE image processing, the sheer speed of the sequential shooting enables the camera to capture stills at up to 3.1 shots per second until the memory card is full. The same goes for movie clips, but this time with a high frame rate of 30fps, even at 640x480 pixel video image size. It's a little beauty at the price.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

ANALYSIS – STILL CAMERAS

There's still a gulf between stills cameras and video cameras, even if they're using similar sensors to record digital images. All the stills cameras on test naturally put multi-megapixel still image quality at the top of the list but what's more surprising is the varying number of Megapixels available in the price bracket. This ranges from 3.2Mp for the Kyocera up to 5.3Mp for the HP. As a guide, 3Mp is a safe minimum for A4 printing, while 4Mp and above is good for A3 prints or even posters, so you have to ask yourself how big a picture you really want?

When it comes to video clips, there's almost no digital camera on the market that doesn't boast video capture to some extent. If you're serious about video recording with your stills camera, a model that has a resolution of 640x480 pixels is ideal for full-screen TV playback and faster frame rates of 24 to 30fps are to be preferred. It's surprising how many stills cameras don't enable lens-zooming while in video mode, which could be another deciding factor. For video excellence, the surprisingly inexpensive Kyocera is the pick of the bunch, and there's also a 5Mp model (the FineCam S5R) if you want more than 3.2Mp for stills.



EDITOR'S CHOICE

Canon MVX25i

PRICE £725 (£617 ex VAT)

SUPPLIER Direct www.prcdirect.co.uk

INFO www.canon.co.uk

As we've concentrated this lab on camcorders that can also double as a digital camera, there could really be only one winner. Canon's new MVX flagship was clearly the most accomplished stills snapper of this month's selection. It offers the most photographic detail and best colour fidelity. But it's also one of the best camcorders around, with video quality only narrowly bettered by our Performance Award winner. Overall, a stunning camcorder for any video-making enthusiast.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10



BEST PERFORMER

Panasonic NVGS200B

PRICE £748 (£637 ex VAT)

SUPPLIER Ask Direct www.askdirect.co.uk

INFO www.panasonic.co.uk

Panasonic's three-chip approach was always going to be hard to beat, and the NVGS200B delivered exactly as expected. With a CCD for each of the three colour signals, this camcorder offers incredible colour and contrast in any lighting condition. It's capable of very good still image performance, too. Yet it's still tiny and pocket friendly. If your primary need is top class video quality, then the Panasonic NVGS200B will deliver the goods for you.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

ANALYSIS – CAMCORDERS

This month's winners exhibit superb video quality compared with even top-of-the-range analog camcorders of just a few years ago. But there's still plenty of opportunity for improvement.

Although still image quality has reached a printable level for the best camcorders, it's still nowhere near the six or even eight Megapixels of the top stand-alone digital cameras. However, Panasonic will shortly be closing in with a new model called the NVGS400B. Like the NVGS200B, it sports a trio of CCDs, but this time they're one Megapixel each, which will boost stills resolution to 2,288x1,728. This equates to four Megapixels, so some interpolation is presumably used. But the traditional three-CCD approach (see page 96) is being questioned.

JVC's GR-PD1 uses a 1.18 Megapixel CCD and a different filter to other single-chip camcorders. The Hybrid Primary/Complementary Progressive Color Filter System uses a combination of white, cyan, yellow and green pixels to form a colour signal that's around three quarters the resolution of the monochrome signal – much better than previous single-chip camcorders, good competition to three-chippers, and professionally priced.

PCPlus PC SYSTEM LAB TEST

→ Seven next-generation portables road-tested



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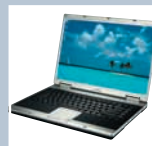
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Editor's Choice

Our top award for products that combine exceptional performance and quality with superb value for money



Performance Award

Awarded to products that excel in our performance and quality tests, where money is less important



Value Award

Awarded to products that represent outstanding value for money, giving you more bangs per buck



Dean Evans

dean.evans@futurenet.co.uk

Dean has come to a realisation that the best laptop is nearly always the one you see after just buying a new laptop.

The new Centrino

The new Dothan-core Pentium M hopes to boost laptop performance. Dean Evans puts seven of the newest power portables to the test

It's been over a year since Intel launched its Centrino mobile technology, a holy trinity of components that consisted of the Pentium M processor, 855-series motherboard and integrated 802.11b wireless LAN. The first Banias-core Pentium Ms blended the low-power operation of Intel's Pentium III chip with the performance of a Pentium 4. With 77 million transistors and a full 1MB of L2 cache, Pentium M machines offered both high performance and long-lasting battery life – rarely did a laptop deliver both.

Beyond Centrino, Intel has a 'Centrino 2' platform in development, codenamed Sonoma. The full implementation of this next-generation of mobile technology plans to include a new 'Alviso' chipset (upping the FSB speed from 400MHz to 533MHz), high-definition audio, new DirectX 9 integrated graphics (GMA 900), Gigabit Ethernet, Serial

ATA and PCI Express. The Sonoma setup will also feature the successor to the Banias-core processor, a chip that squats on the Intel roadmap under the code-name of 'Dothan'.

Unlike some of the other Sonoma components, 1.7, 1.8 and 2GHz Dothan-core processors (of the 400MHz variety) are available today. Fabbed using Intel's 90nm process, these chips benefit from twice the number of transistors (140 million) and double the L2 cache (2MB). But do they deliver a significant performance increase over their Banias brothers?

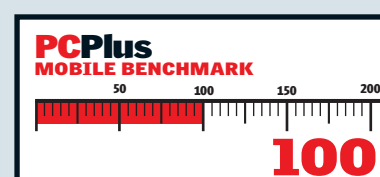
This month we've put a selection of Dothan-core portables through their paces. Tested with MobileMark 2002 (for system performance and battery life) and 3DMark 2001SE and 3DMark03 for graphical might, we hope to see whether the Dothan processor offers a dramatic performance increase over the old Banias design.

Your guarantee

The manufacturers have guaranteed that these PCs will be available with their featured specifications while this issue of PC Plus is on sale – from 03/08/04 to 01/09/04. Any component changes will be due to unforeseen shortages. Note: replacement parts may increase the system price.

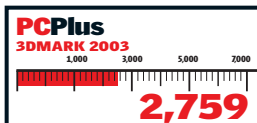
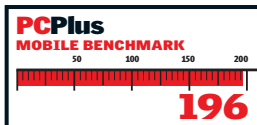
THE PC PLUS BENCHMARK FOR LAPTOPS PROVIDES INFORMATION YOU CAN TRUST

The benchmark score for laptops is derived from running MobileMark 2002, which evaluates every aspect of a portable system, not just the speed of the processor. The score is based on the average response time for a calibration platform – a 1GHz Pentium III processor, 256MB RAM, 30GB hard drive, ATI Rage Mobility graphics adapter, Windows XP Professional Edition. The score for this system is 100.



INFORMATION

PRICE £1,984 (£1,689 ex VAT)
SUPPLIER ACI 0208 830 1958
INFO www.aciplc.com
WARRANTY Three years C&R



With its pleasant black and silver design, ACI's Centurion Pro has the serious look of a business portable about it. But does a business machine typically boast the latest ATI graphics processor? Does it need a massive 1.5GB of RAM? The slim Compal CL56 chassis may not suggest that there's a fun multimedia nightlife waiting to be discovered, but the Centurion Pro has all the features in place to mix it with the big boys. On paper, at least, this is a strong specification.

But it's the testing that ultimately proves how good or bad a machine is

and after a MobileMark 2002 workout, the Centurion Pro posted an eye-catching score of 196 and a battery life of 235 minutes. We've been seeing high scores from the initial run of Dothan processors and this 1.7GHz incarnation is no exception. But the new Intel chip still doesn't show a dramatic improvement over the high-end Banias-cores. The MobileMark score here is certainly high, but AJP's M6000 laptop (featuring a 1.7GHz Banias-core Pentium M) has notched up higher numbers with a cheaper price tag. If you're going to go Dothan,

it might make sense to opt for faster 1.8 or 2GHz version of the processor.

As for the visuals, these are well in-line with the standards set by the ATI Mobility Radeon 9700. The Centurion Pro posts a 3DMark 2001SE score of 9904, while 3DMark pumps out a buff score of 2,759.

Such performance scores show that ACI's machine laughs in the face of Word and Excel and is capable of handling the latest texture-intensive 3D games, such as FarCry, albeit with some of the higher options disabled. We've seen higher scores than these, but from faster machines. So considering the overall specification here, the benchmarks mark this out as an excellent all-round portable.

From its stylish good looks to its enviable performance, this Dothan-equipped Centurion Pro certainly stands out from the crowd. It's not designed specifically as a multimedia notebook, but it hits most of the major bases.

There's plenty of expansion potential too and a comprehensive feature-set that includes a dual format DVD/RW drive, 802.11bg, a whopping 1.5GB of memory, fast M11 graphics and an SD/MMC flash card reader. There's also scope to add an external TV tuner too, such as Hauppauge's superb WinTV PVR 2, to up the multimedia specification. But does all this justify the £1984 price tag? Not quite...

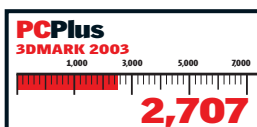
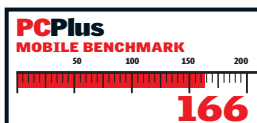
PCPlus ratings

ACI CENTURION PRO



INFORMATION

PRICE £1,408 (£1,198 ex VAT)
SUPPLIER AJP 0208 208 9700
INFO www.ajp.co.uk
WARRANTY Three years RTB



We've seen AJP's stylish M9000-series 'Digital Entertainment Gateway' before (in its Banias incarnation) and were impressed at its high performance and long-lasting battery life. It was hardly a surprise – the machine is a chunky widescreen model, stacked with the latest technology. This new 1.8GHz Dothan-core version pushes it further.

Barely eight months ago, 512MB of RAM and a 40GB hard disk could be considered standard issue on new laptops. But the availability of cheaper drives has effectively doubled the

storage capacity in new machines and we're now seeing portables like this with 80GB units. Similarly, the integrated DVD/RW is a multi-format drive, capable of reading/writing -R/-RW and +R/+RW media. It's easily up to the technological standards we've come to expect at this price point.

A good laptop needs a good balance between battery life and performance and the M6NE chips in with a first-rate MobileMark score of 166, and a battery life of approximately 193 minutes. While Intel claims that its 90nm Dothan chips consume less

power than the Banias-core processors, this doesn't seem to be the case as far as the benchmark scores are concerned. Both the performance rating and the battery life are lower than expected, but you've got to balance this with the fact that the 1.8GHz chip certainly packs a bigger punch than a 1.7GHz Banias.

As far as graphics are concerned, the onboard ATI Mobility Radeon 9700 GPU posts a commendable 3DMark 2001SE score of 10,426 and a score of 2,707 in 3DMark03. God bless the 9700. It's done more than any other GPU to narrow the gap between laptop and desktop PC performance, making it possible to play the latest 3D games like FarCry, in 1024x768 resolution with full detail. Sony's S1XP may have the clearest, brightest display here, but AJP's machine is blessed with the best resolution. Where many widescreen notebooks make do with a 1280x800 resolution, the M6NE can be pushed as high as 1680x1050 pixels.

The M6NE pushes all the right consumer buttons. It boasts a fantastic widescreen display, a powerful all-rounder specification (including an 802.11bg module) and the performance to encompass both business and leisure. The three-hour battery life is a bonus, making this an ideal mobile machine and a solid alternative to a hungrier P4-based system.

PCPlus ratings

AJP M6NE





The white plastic shell on the chassis of Carrera's Travelstar D17+ instantly sets it apart from its black and/or silver opponents this month. Clevo's M385C case feels like a more lightweight version of the giant D480W desktop replacement system – it even features a similar webcam integrated into the space above the 16:9 display. Nevertheless, it's a good size for a Centrino system that aims to provide flexibility and extended mobility.

The 1.7GHz Dothan processor doesn't offer a dramatic performance increase over a 1.7GHz Banias-core

chip, 512MB of RAM is standard issue brainpower, while the 60GB hard disk is a so-so performer. The most advanced component here is actually the NEC ND-6500A DVD/RW drive, which not only features current +RW and -RW recording options but also dual-layer DVD+R9 support. It's the first notebook we've seen to feature such a drive. It won't be the last.

Although it's a similar size to the Rock, Mesh and Evesham machines, the Travelstar D17+ does boast a slightly better LCD, with a native resolution of 1280x1024 pixels. It's yet another top

feature that made us ring up Carrera's PR people to check that the sub-£1,000 price point was correct. Obviously there has to be a catch somewhere. The overall performance score is nothing to shout about, but the Travelstar D17+ did manage to last longer than many of the systems here. Its three-hour run is an achievement, although we've seen Banias-core laptops eke four hours from their Li-Ion cells.

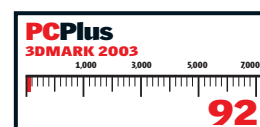
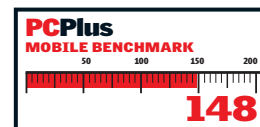
No, the catch is the fact that the machine relies on Intel's onboard 855GM chipset, which records a lightweight score of only 1,888 in the 3DMark2001SE benchmark and a score of 92 in 3DMark03. These woeful numbers mean that this laptop's multimedia ambitions are severely limited. Intel's next generation of graphics (GMA 900) is on the way, but that's little compensation here.

This machine certainly shows promise – it boasts a decent, high-resolution display, a dual-layer DVD writer, plus good connectivity options. It is let down badly by poor graphics performance, and we've yet to be convinced that the 1.7GHz Dothan chip puts in a better performance than its Banias-core predecessor.

Ultimately, it's a strange mix of multimedia functionality and some disappointing processing power. But the low price tag makes the Travelstar D17+ worth a second, longer look.

INFORMATION

PRICE £938 (£798 ex VAT)
SUPPLIER Carrera SSC 0871 222 3456
INFO www.carrera.co.uk
WARRANTY Three years RTB



PC Plus ratings

CARRERA TRAVELSTAR D17+

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8



Like three other machines here, Evesham's Dothan-core laptop has been built around the sleek black/silver Mitac 8050 chassis. It's an appealing all-round form factor, blessed with a comfortable full-sized keyboard and a 15.4-inch widescreen LCD. Considering its size, the Voyager 645 is reasonably lightweight, inhabiting that no-man's-land between the average portable and the desktop replacement system.

With its 1.8GHz processor, the Voyager 645 gets slapped with Intel's 745 designation and you'd hope for

decent performance from it. What you can't appreciate from the spec sheet is that the 60GB hard drive is a fast 7200rpm model, and it's worth noting that the UJ-815 DVD-RAM drive doesn't support the +RW standard, unlike some dual format drives in this test. But scan down the rest of the spec sheet (see the table on page 82) and you'll see that the Voyager 645 is well equipped as a mobile all-rounder.

If battery life is more important to you than raw performance, then consider this: MobileMark rates the Voyager 645 with an average life of

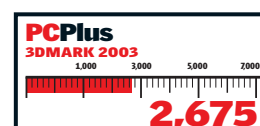
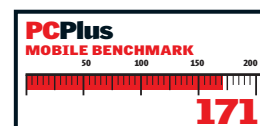
only 126 minutes. But if performance is key, MobileMark rates its performance with a noteworthy 171. Considering that we regularly get scores of 150-190 for high-end Pentium 4 machines, the MobileMark score here is reasonable enough. But it's below some of the numbers we've seen on 1.7GHz Banias systems and an indication that the chip isn't working to its full potential.

Nevertheless, the onboard Mobility Radeon 9700 is a big hitter. When you get into benchmark territory, you can see that you're not going to get the sort of 10,000+ scores in 3DMark that the current 3GHz P4s can deliver – the Pentium Ms aren't that good. But the scores here are decent enough (7310 in 3DMark2001SE, 2,675 in 03), showing that a Dothan machine is a jack-of-all-digital-trades; master of none.

There's an unshakable feeling that the Dothan core Pentium M has yet to show its true colours. In this Evesham machine it's an average performer, intelligently SpeedStepping from 1800MHz down to 600MHz as power requirements fluctuate. The fan emits a noticeable, pulsing whine when the processor is pushed to its limit, but other than that, this is a well-specced machine that's capable of accessing the Internet from a cafe, acting as a mobile office, and moonlighting as an entertainment console.

INFORMATION

PRICE £1,349 (£1,148 ex VAT)
SUPPLIER Evesham 0870 160 9500
INFO www.evesham.com
WARRANTY Three years (one year OSM, two years RTB)



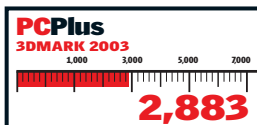
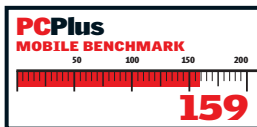
PC Plus ratings

EVESHAM VOYAGER X5 PM18

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

INFORMATION

PRICE £1,173 (£998 ex VAT)
SUPPLIER Mesh 0870 046 4747
INFO www.meshcomputers.co.uk
WARRANTY Three years RTB



Mesh's Dothan-core Dynamo M11 may use the same 8050 chassis as the Evesham and Rock laptops, but it's still a very different machine. Instead of cramming in the latest components, Mesh has cut a few technical corners on this 1.8GHz machine to get it down to an attractive £999 ex VAT price point.

As MobileMark 2002 attempts to test real-world usage (by pausing all benchmark activity between its many tests), we can get a fairly accurate representation of how good a machine is and how long it will last on battery power. The system performance

here was rated with an admirable score of 159, while the battery life hit a high of 150 minutes. The 1.8GHz Dothan chip is capable of some excellent all-round performance, throttling the clockspeed up and down according to the type of applications you're running. It's this smart power management that gives the Centrino platform the extra battery life and make it an ideal alternative to a heavyweight P4 system. Considering the low price, it seems unfair to criticise the 40GB hard disk, which is half the size of HDDs being used in laptops elsewhere.

Considering the ATI Mobility Radeon 9700 VPU installed, the 3DMark 2001SE score of 10,307 is right up there with the top performers, while a workout with 3DMark 2003 rated the chipset with a score of 2,883. ATI dominates the graphics market – it has a 72 per cent market share if reports are to be believed. The new 9700-series Mobility Radeon has done much to advance this reputation and the scores here mark the machine as a graphical high-flyer. Multimedia will pose no problem for this Dynamo.

As supplied, Mesh's entrant doesn't feature a DVD/RW drive and makes do with an older DVD/CD-RW combo unit, which is perfectly adequate for writing and rewriting data discs on the move. The expansion options, meanwhile, include: 3x USB 2.0 ports, 1x FireWire interface and a standard type II PCMCIA slot. This chassis also features a 3-in-1 card reader, supporting SD/MMC and MS flash formats.

Ultimately, the Dynamo is an odd machine. It features one of the newest mobile processors available, but it compromises on the quality of its hard disk and the versatility of the optical drive. The imbalanced specification is down to Mesh's focused pursuit of the £999 ex VAT price point and, while it seems a good value option, it might be worth paying that little bit extra for some extra future-proofing.

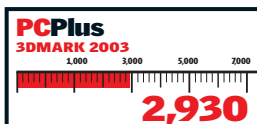
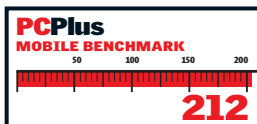
PCPlus ratings

MESH DYNAMO M11



INFORMATION

PRICE £1,761 (£1,499 ex VAT)
SUPPLIER Rock 0870 990 9090
INFO www.rockdirect.com
WARRANTY Three years C&R



With an eye-catching black and silver chassis, Rock's Pegasus TI notebook offers the fastest Pentium M chip currently available. But while the new Dothan-core processor inside will undoubtedly turn heads, the TI needs to do more to impress than simply power down the MobileMark straight. In such a high-end, high-priced system, we're looking for more than number crunching. We demand an all-rounder.

The Pegasus TI is built around a 2.0GHz Pentium M processor, and it looks to be a system that packs quite a punch. Stacked with 1GB of RAM, the

other core component is an excellent 60GB hard drive. Looking at the numbers, it's the best performer here, posting a first-rate MobileMark score of 212, and a battery life of approximately 172 minutes. The high MobileMark score that shows just how good the core performance of the Dothan-core processor is – only the top-end P4s post scores anywhere close to it.

As far as its other features are concerned, the Pegasus TI boasts a DVD/RW, a powerful step up from a DVD/CD-RW unit, plus a decent 15.4in widescreen 1280x800-pixel LCD,

although it lacks the pure clarity of the X-Black display on Sony's S1XP. Rock does have its own equivalent – dubbed X-Glass – and perhaps it will incorporate it into future models.

The TI is yet another machine that incorporates ATI's Mobility Radeon 9700 and this posts a stunning 3DMark 2001SE score of 10,470 and a rating of 2,930 under slightly harsher 3DMark03 conditions. Obviously this model represents the top of Rock's TI range and its 9700-series chipset imbues it with the visual oomph to handle everything from Excel to Everquest. Alongside the 2GHz Pentium M chip, this machine is a beast.

The TI arguably represents the best that the Centrino platform has to offer and other highlights include: a 3-in-1 card reader, integrated subwoofer and 802.11bg wireless LAN. The battery life is a little disappointing, but the TI is still a better all-rounder than some of the P4 systems we've seen recently. Reports suggest that Intel will push the Dothan core to 2.1GHz before the year is out, upping the mobile performance by another five or ten percent.

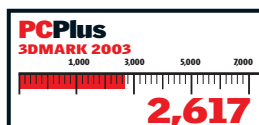
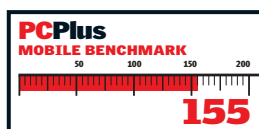
Cheaper machines are available, but few can match the TI's 200+ MobileMark scores. All it needs to become perfect portable is a higher resolution display, more storage capacity and a dual layer DVD/RW.

PCPlus ratings

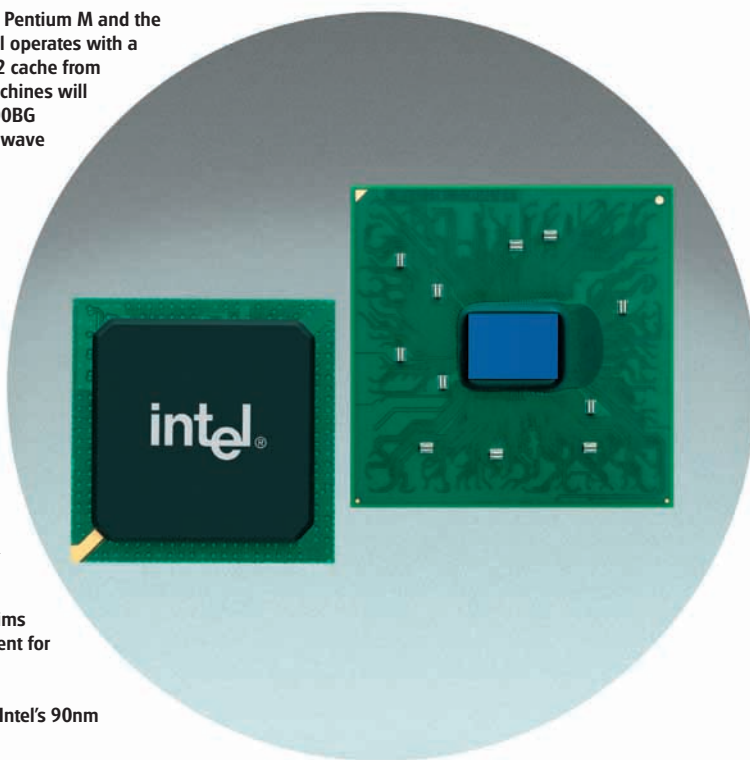
ROCK PEGASUS TI



PRICE £1,699 (£1,446 ex VAT)
SUPPLIER Sony 0207 365 2947
INFO www.vaio.sony-europe.com
WARRANTY One year (extendable to three with VAIO Plus Warranty)



OVERALL 9



This month's laptops examined in detail



DETAILS

Model	ACI Centurion Pro	AJP M6NE	Carrera Travelstar D17+	Evesham Voyager X5 PM18
Price	£1,984 (£1,689 ex VAT)	£1,408 (£1,198 ex VAT)	£938 (£798 ex VAT)	£1,349 (£1,148 ex VAT)
Supplier	ACI 0208 830 1958	AJP 0208 208 9700	Carrera SSC, 0871 222 3456	Evesham 0870 160 9500
Info	www.aciplc.com	www.ajp.co.uk	www.carrera.co.uk	www.evesham.com
Warranty	3 years C&R	3 years RTB	3 years RTB	3 years (1 year OSM, 2 years RTB)

SPECIFICATIONS

CPU	1.7GHz Pentium M (735)	1.8GHz Pentium M (745)	1.7GHz Pentium M (735)	1.8GHz Pentium M (745)
Chipset	Intel 855PM	Intel 855PM	Intel 855GM	Intel 855GME
Memory	1.5GB PC2700	512MB PC2700	512MB PC2700	512MB PC2700
Hard drive	60GB (7,200rpm)	80GB (4,200rpm)	60GB (4,200rpm)	60GB (7,200rpm)
Optical drive	DVD/RW (+R/RW, -R/RW)	DVD/RW (+R/RW, -R/RW)	DVD/RW (+R/RW, -R/RW, +R9)	DVD/RW (-RAM, -R/RW)
Graphics	128MB ATI Mobility Radeon 9700	64MB ATI Mobility Radeon 9700	64MB Intel Extreme Graphics 2	128MB ATI Mobility Radeon 9700
Display	15-inch TFT LCD (1400x1050)	15.4-inch widescreen TFT LCD (1680x1050)	15.4-inch widescreen TFT LCD (1280x1024)	15.4-inch widescreen TFT LCD (1280x800)
Audio	AC'97	AC'97	AC'97	AC'97
Speakers	Stereo	Stereo	Stereo	Stereo
Other hardware	SD/MMC card reader	4-in-1 card reader (SD/MMC, MS/MS Pro)	CMM PC Camera	3-in-1 card reader (SD/MMC, MS), integrated sub-woofer
Size/Weight	333x276x31mm / 2.8Kg	354x273x22-34mm / 2.5Kg	360x273x28mm / 2.8Kg	354x250x32mm / 2.9Kg

CONNECTIVITY

Comms	802.11bg, 10/100 Ethernet, 56K modem	802.11bg, Gigabit Ethernet, 56K modem	802.11b, 10/100 Ethernet, 56K modem	802.11bg, 10/100 Ethernet, 56K modem
Ports	3x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out, Parallel, S-Video	4x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out, TV-out, Parallel, Replicator Port	3x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out, S-Video, S/PDIF	3x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out, S-Video, SPDIF

SOFTWARE

Operating system	Windows XP Professional Edition	Windows XP Home Edition	Windows XP Home Edition	Windows XP Home Edition
Bundled software	Ability Office 2002, Panda Antivirus	Ahead Nero, ASUSTek ASUSDVD, Panda Platinum Internet Security	Ahead Nero Showtime	WinDVD 4, Pinnacle Hollywood FX, Pinnacle Studio 9 SE, Pinnacle Instant CD/DVD SE

ACCESSORIES

Carry case	Yes	Yes	Yes	No
Extra battery	£117 (£99 ex VAT)	£152 (£129 ex VAT)		£70 (£60 ex VAT)

BENCHMARK RESULTS

MobileMark 2002	196	166	148	171
Battery life	235	193	185	126
3DMark 2001SE	9904	10,426	1,888	7,310
3DMark 03	2,759	2,707	92	2,675

PCPlus verdict 9
PCPlus verdict 8
PCPlus verdict 8
PCPlus verdict 8



DETAILS

Model	Mesh Dynamo M11	Rock Pegasus TI	Sony VAIO VGN-S1XP
Price	£1,173 (£998 ex VAT)	£1,761 (£1,499 ex VAT)	£1,699 (£1,446 ex VAT)
Supplier	Mesh 0870 046 4747	Rock 0870 990 9090	Sony 0207 365 2947
Info	www.meshcomputers.co.uk	www.rockdirect.com	www.sonymstyle.co.uk
Warranty	3 years RTB	3 years C&R	1 year (extendable to 3 with VAIO Plus Warranty)

SPECIFICATIONS

CPU	1.8GHz Pentium M (745)	2GHz Pentium M (755)	1.7GHz Pentium M (735)
Chipset	Intel 855GME	Intel 855PM	Intel 855PM
Memory	512MB PC2700	512MB PC2700	512MB PC2700
Hard drive	40GB (4,200rpm)	60GB (7,200rpm)	60GB (4,200rpm)
Optical drive	DVD/CD-RW	DVD/RW (+R/RW, -R/RW, +R9)	DVD/RW (-RAM, -R/RW)
Graphics	128MB ATI Mobility Radeon 9700	128MB ATI Mobility Radeon 9700	64MB ATI Mobility Radeon 9700
Display	15.4-inch widescreen TFT LCD (1280x800)	15.4-inch widescreen TFT LCD (1280x800)	13.3-inch widescreen TFT LCD (1280x800)
Audio	AC'97	AC'97	AC'97
Speakers	Stereo	Stereo	Stereo
Other hardware	3-in-1 card reader (SD/MMC, MS), integrated sub-woofer	3-in-1 card reader (SD/MMC, MS), integrated sub-woofer	802.11bg, Bluetooth, 10/100 Ethernet, 56K modem
Size/Weight	354x250x32mm / 2.9Kg	354x250x32mm / 2.9Kg	312x225x35mm / 1.89Kg

CONNECTIVITY

Comms	802.11bg, 10/100 Ethernet, 56K modem	802.11bg, 10/100 Ethernet, 56K modem	802.11bg, Bluetooth, 10/100 Ethernet, 56K modem
Ports	3x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out, S-Video, S/PDIF	3x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out, S-Video, SPDIF	2x USB 2.0, 1x FireWire, 1x PCMCIA, VGA-out

SOFTWARE

Operating system	Windows XP Home Edition	Windows XP Home Edition	Windows XP Professional Edition
Bundled software	MS Works 7.0	Ability Office 2002, Panda Anti virus	Adobe Photoshop Album SE, PictureGear Studio, Adobe Photoshop Elements, Adobe Premiere Standard, WinDVD, MoodLogic, SonicStage, DVGate Plus

ACCESSORIES

Carry case	Yes	Yes	Yes
Extra battery	£152 (£129 ex VAT)	£117 (£99 ex VAT)	N/A

BENCHMARK RESULTS

MobileMark 2002	159	212	155
Battery life	150	172	235
3DMark 2001SE	10,307	10,470	10,120
3DMark 03	2,883	2,930	2,617

PCPlus verdict 8
PCPlus verdict 9
PCPlus verdict 9

PCPlus Results

Each laptop is put through a series of benchmarks to give an accurate picture of its performance

The PC Plus benchmarks are designed to rigorously test every aspect of a computer in order to make an exact judgement on its overall performance. Each chart on this page enables you to tell, at a glance, how each system has performed in the individual areas – MobileMark 2002, 3DMark 2001SE and the length of battery life.

MobileMark 2002 is a combined benchmark that tests both application performance and portable power. Like the desktop versions of our benchmark software – SYSmark 2002 and SYSmark 2004 – MobileMark uses a mix of popular programs to simulate real-world laptop usage. These include Adobe Photoshop 6.0.1, Microsoft Word 2002 and Netscape Communicator 6.0.

Key to producing a performance rating is the ability of MobileMark 2002 to pause briefly between the featured modules, thereby simulating a break in productivity from a virtual user. This gives us a more accurate indication of mobile performance compared to the constant application usage model favoured by SYSmark 2002.

Battery life is also measured using the MobileMark 2002 benchmark.

Finally, PC Plus uses both the 2001SE and the 2003 editions of the 3DMark benchmark. Only the results for 3DMark2001SE are shown on the table here, however, as some of the laptops tested were only able to complete one of the four 2003 tests. The 2003 results, where applicable, are shown on the reviews themselves.

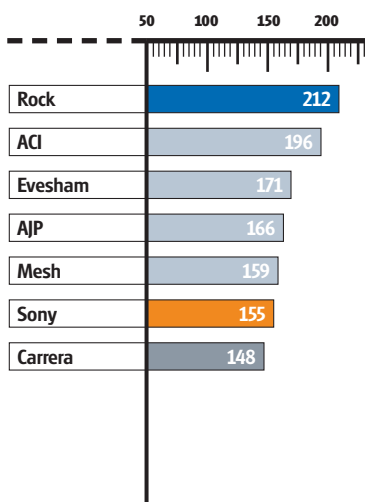


While 3DMark 2001SE tests DirectX 8.1 performance, the updated 3DMark 2003 benchmark indicates a laptop's prowess with DirectX 9 workloads.

AWARD WINNERS

Editor's Choice
Value
Performance

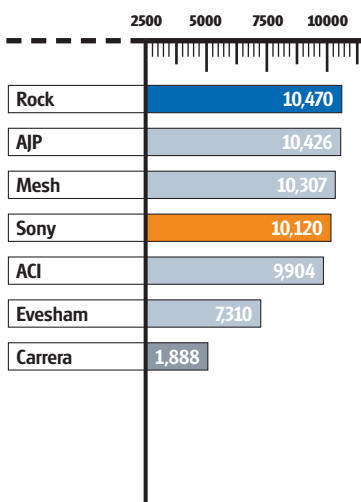
System performance MobileMark 2002



The overall benchmark scores here are taken from the rating generated by MobileMark 2002. Like its desktop-testing counterpart, SYSmark, MobileMark tests a laptop's performance under simulated user conditions, using software such as Adobe Photoshop, Outlook, Word and Excel.

Bigger is better

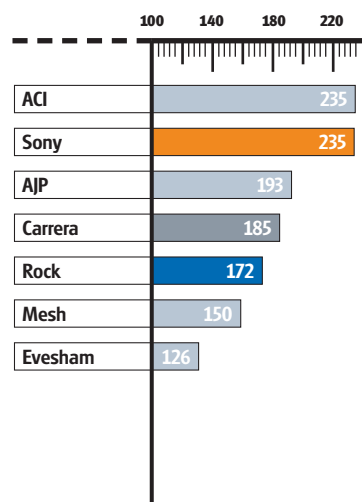
3DMark2001 results 1,024 x 768 x 32-bit



3DMark2001SE benchmarks a PC's graphics subsystem at a number of different resolutions. Although only the default scores are listed here, each PC is also tested at the higher resolution of 1,280 x 1,024 x 16-bit. Some portable LCDs can only be tested at their native resolution.

Bigger is better

Battery life (mins) Power-saving disabled



Extended battery life is vital for a machine that needs to be your work terminal whilst on the move. The range of battery life varies according to the system type, but a good Centrino-based system should be able to offer three to four hours of longevity. Some of the systems this month come up short.

Bigger is better

PCPlus Verdict

If you're tempted by Intel's new Dothan technology, then here are the three laptops we recommend.



EDITOR'S CHOICE

Sony VAIO VGN-S1XP

PRICE £1,699 (£1,446 ex VAT)
SUPPLIER Sony 0207 365 2947
INFO www.sonymstyle.co.uk

It was a tough call to pick a winner this month, but the machine we'd most like to keep for ever is Sony's stylish new VAIO. It's not the fastest machine here, but it's certainly one of the better mobile options, blessed with a battery life close to four hours. What sets the S1XP apart is its gorgeous build quality and unrivalled connectivity – featuring both Bluetooth and 802.11bg. But it's the fantastic X-Black display that clinches the whole deal, making



you realise how washed-out traditional LCD panels can be. Best of all, perhaps, the S1XP isn't ludicrously over-priced – a compliment that Sony systems rarely receive. Powerful, lightweight and easily the best-looker in the group, the S1XP is simply stunning. If the price doesn't pose a problem, you'll be more than happy with this all-rounder. Ecstatic even.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

ANALYSIS

Is there ever a good time to buy a notebook?

There's actually a simple answer to this question: no. Desktop systems have an easy upgrade path, so you can buy a PC at any time, safe in the knowledge that you can rip out any component to replace it with something better and faster. Laptops are a different kettle of fish, as several of the key elements – the LCD, the processor and the 3D graphics subsystem – can't be easily upgraded. So what you buy is what you're stuck with.

Even now, there are several technology enhancements on the horizon that will significantly boost laptop performance. As mentioned elsewhere in this Lab Test, Intel is still working on a successor to its Centrino platform, dubbed 'Sonoma'. Sonoma will migrate several new desktop technologies into the mobile space, including Serial ATA, high-definition audio and DirectX 9.0 integrated graphics. We're already seeing laptops appearing with Gigabit Ethernet connections, while Carrera's Travelstar D17+ machine is one of the first to offer a dual layer DVD/RW drive.

Beyond these improvements, the next leap forward will be the adoption of PCI Express graphics. Nvidia is working on an MXM module (see page 16) featuring a mobile version of its GeForce 6800 design; while ATI has readied its own Radeon X600 module. Just as PCI Express graphics has almost doubled the graphical capabilities of desktop systems, the arrival of mobile versions will effectively wipe out the performance gap.

Laptops will also benefit from better, high-quality display technology. Sony's S1XP VAIO stands out from the rest this month thanks to the clarity of its X-Black screen technology. The X-Black screen is coated with a light-diffusing layer and uses a glare filter to maximise colour definition and clarity. It makes a huge difference to the quality of the display and we hope to see more of these high-quality LCDs in the future.



BEST PERFORMER

Rock Pegasus TI

PRICE £1,761 (£1,499 ex VAT)
SUPPLIER Rock 0870 990 9090
INFO www.rockdirect.com

Based on raw benchmark numbers alone, the Pegasus TI just nips past ACI's impressive Centurion Pro to bag the PC Plus Performance award. The 2GHz Dothan-core processor is capable of some blistering performance, both in terms of general number crunching and graphical potency. The battery life suffers, however, and it gets nowhere near the four hours posted by some of the other systems. But it's a small niggle if you desire the most powerful Centrino machine available.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10



BEST VALUE

Carrera Travelstar D17+

PRICE £938 (£798 ex VAT)
SUPPLIER Carrera SSC, 0871 222 3456
INFO www.carrera.co.uk

Of all the machines here, Carrera's white-cased Dothan-core notebook represents the best value for money. Mesh comes close with its attractive Dynamo M11, but even this value notebook can't match the Travelstar D17+ package. True, it's not the best performer and the graphics performance is five times worse than the best notebook here. But focus on the good points: with a 60GB HDD and a unique dual-layer DVD/RW unit, you're getting an unbelievable bargain.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

PCPlus SOFTWARE LAB TEST

→ We get creative with five web authoring tools



Chris Schmidt
chris@track5.co.uk

Chris has been creating web content since the Mosaic browser was introduced, and has built hundreds of sites

Weaving the web

Still using Notepad for your Web pages? Chris Schmidt delves into the leading web authoring tools you should be using

There was a time when all you needed to create a website was a copy of Notepad and a web browser. Obviously, an Internet connection helped, but since dynamic coding was yet to emerge, such static content could be easily previewed locally without having to worry about server intervention or database connectivity. Those days are long gone, and by hand-coding a site in Notepad you're missing an opportunity to use some of the best, and most versatile software available.

Even the earliest web designers were grateful for the first HTML editors, which effectively transformed word processing shortcuts into raw code, streamlining

the insertion of common tags and, eventually, allowing direct previews of your code within the application as it might appear within the browser.

These days, however, we're spoilt for choice with applications that not only provide layout tools, but also handle site and asset management features, CSS tools, template creation, and support for more dynamic languages such as PHP and ASP. Such variety has transformed the web from a static brochure-ware environment into the dynamic and immediate media we now take for granted. But which package should you choose? Or have you considered changing your coding approach? Read on – we've got all the bases covered.



Editor's Choice

Our top award for products that combine exceptional performance and quality with superb value for money



Performance Award

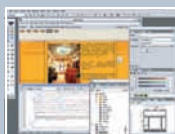
Awarded to products that excel in our performance and quality tests, where money is less important



Value Award

Awarded to products that represent outstanding value for money, giving you more bangs per buck

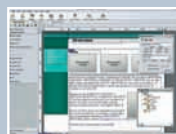
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ADOBE GoLive CS

INFORMATION

PRICE £394 (£335 ex VAT)
SUPPLIER Adobe 0870 606 0325
INFO www.adobe.co.uk

REQUIREMENTS

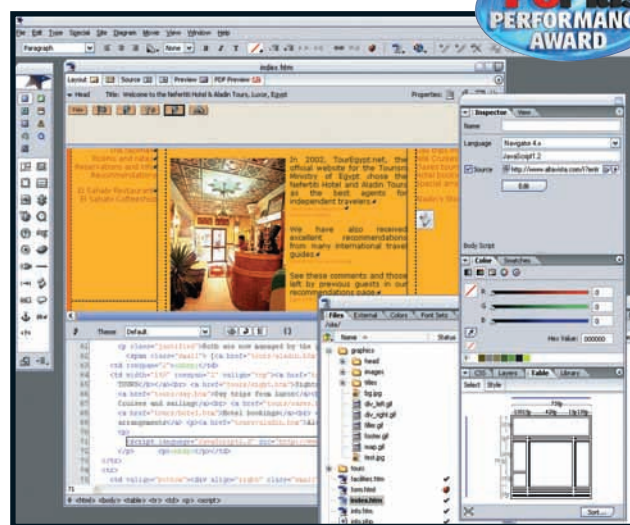
CPU Pentium III
RAM 128MB
OS Windows 2000 SP3 or XP

When GoLive CyberStudio, as it was originally known, was released, it became one of the first successful WYSIWYG web authoring applications and, as such, attracted a large and loyal user base. It's easy to see why when you discover the range of features it offers. With Adobe's high-profile backing and a number of upgrades along the line, the seventh generation of the software manages to pack in a whole load of features that make it an invaluable tool for both designer and developer alike.

As part of the Adobe Creative Suite, there are close links with Photoshop and InDesign, while the latest version finds advanced PDF integration that makes the creation and management of Acrobat files possible directly from within GoLive. Such integration clearly allows many additional benefits when creating graphical assets, such as image resizing, which utilises the power behind Photoshop or Illustrator.

Cascading Style Sheet recognition and previewing is another new aspect that designers and coders will appreciate, as both CSS Level 1 and 2 are supported and rendered directly within the application. The new split-view interface will enable you to see both code and design views at last, which is a feature that Dreamweaver users have been enjoying for some time.

Those without too much programming experience will find the new Co-Author feature of benefit, as predefined page areas can be edited as easily as using a word processor. More hardened developers will appreciate the control the software provides over dynamic content with XHTML, SVG and XML being more recently introduced.



Adobe GoLive CS is a powerful and comprehensive title with a loyal professional following, although its busy interface may present problems to users who are unfamiliar with the tool.

Despite its obvious strengths, GoLive hasn't quite grasped the imagination of the creative communities. There are no obvious reasons why this should be – the software is powerful, comprehensive and reliable, although we can only assume the Adobe approach doesn't quite suit the average coder. The interface, although familiar to users of other Creative Suite titles, can leave the new user somewhat baffled with its myriad of palettes and hidden configuration options. But it's worth persevering with.

PCPlus ratings

ADOBE GOLIVE CS

Value: 9/10

Features: 9/10

Performance: 9/10

OVERALL: 8

MICROSOFT FrontPage 2003

INFORMATION

PRICE £170 (£145 ex VAT)
SUPPLIER Dabs www.dabs.com/uk
INFO www.microsoft.com

REQUIREMENTS

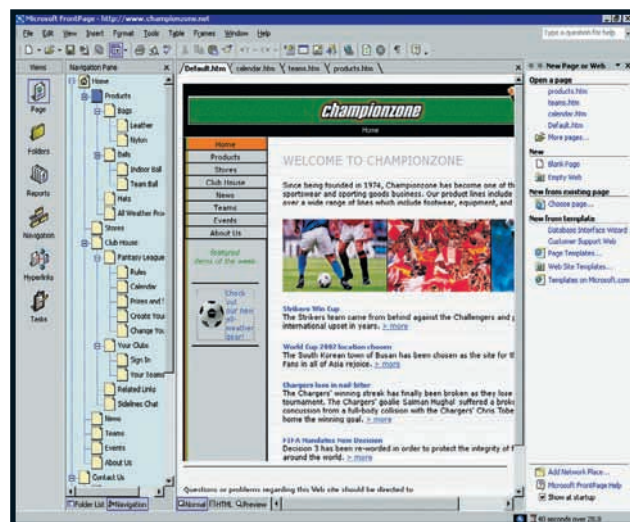
CPU 233MHz Pentium II
RAM 128MB
OS Windows 2000 SP3 or XP

Microsoft's web authoring package has a history that exceeds most titles, and if volume of sales is an indicator, it's by far the most popular application. But tell this to any professional web designer and you'll get the same baffled look. It isn't that FrontPage is a bad application, but the options available are somewhat too restricted to allow the discerning creative the freedom to fully express their skills.

True, there are all the features you'll need to create functional websites, with design tools that support dynamic templates, advanced table layout options and improved browser support. The split-screen view is also introduced at last, and a Quick Tag Selector and Editor show further influences from established Dreamweaver concepts. Coders will appreciate how Microsoft has recognised that HTML generated through Word is quite poor, as features are introduced to remove and clean up such problematic code.

The program also offers JScript and VBScript support, while the integration of Microsoft SharePoint Services and Windows Server 2003 provide XML, Web services and OLE Database data sources. These provide advanced features that take advantage of the close relationship the software has with Microsoft's popular Internet Explorer browser.

Despite an impressive range of options, the software seems to remain too quirky for the dedicated creative. Whereas GoLive and Dreamweaver have links with industry-standard creative tools, FrontPage ties in with the ubiquitous Office suite and it is this corporate, clinical influence that dissuades professional designers from adopting it. There are



Sporting an interface that is instantly familiar to Microsoft Office users has certain advantages, although the professional user will find the FrontPage approach too restrictive.

also natural links with the Microsoft IE browser, which can cause issues when creating content compatible with rival viewers. Microsoft has addressed this to some degree, although a legacy remains with coding that still requires dedicated server extensions to take full advantage of available features.

For the Office user, FrontPage is a natural choice. For those who want to explore the full potential of the web, there are more flexible options available.

PCPlus ratings

MICROSOFT FRONTPAGE 2003

Value: 9/10

Features: 9/10

Performance: 9/10

OVERALL: 7

NETOBJECTS Fusion 8

INFORMATION

PRICE £120 (£102 ex VAT)
SUPPLIER Amazon
www.amazon.co.uk
INFO www.netobjects.com

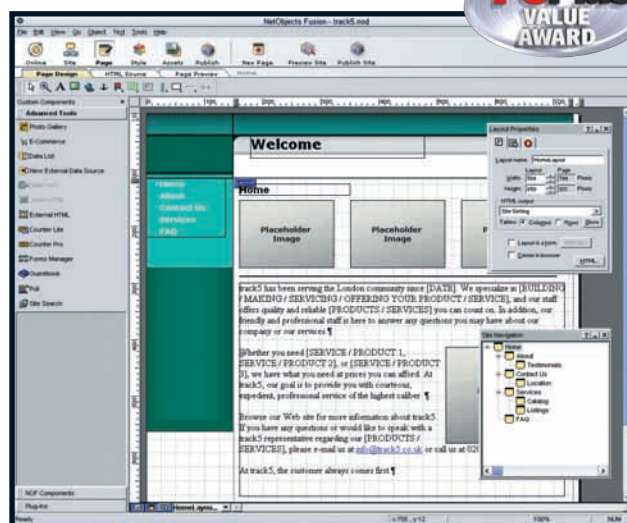
REQUIREMENTS

CPU 166MHz Pentium
RAM 64MB
OS Windows 98 or later

NetObjects Fusion is another title that's been around for some time, now finding itself in its eighth generation. Unlike conventional web authoring tools, Fusion takes on a more wizard-based approach that enables the relatively quick creation of a site. It makes use of templates that use common page structures, together with familiar file structures to achieve a generic end result. Even initial content is put in place, which can be modified as required to better suit the purpose of the site you're creating.

This method has definite advantages if you want to churn out fast, yet cheap and cheerful results, but you won't win any design or performance awards by using the default options. However, by making use of the various design and production features included, it is possible to adopt more individual templates – either from third-party developers or that you've created yourself. You can also employ various components for the integration of DHTML content, such as drop-down menus and rollovers. Similarly, more technical aspects are supported that provide database connectivity through all the usual suspects – including MySQL, ASP, PHP and ColdFusion.

The software is arguably the easiest in our Lab Test to get to grips with, thanks to its largely wizard-based approach, although moving away from the rather generic content to create more individual results will take a little more time and effort. But thanks to the well-organised interface, exploring the available potential is intuitive. It enables users who are new to the software, and to the medium, to get up to speed relatively quickly and to see some satisfying results.



Being heavily driven by wizards and templates, NetObjects Fusion 8 enables the creation of quick generic results – without you ever needing to see a line of code.

However, we suspect that the majority of Fusion users are non-technical authors, preferring to work in the icon-driven WYSIWYG modular design environment. It is possible to access the raw code, although excessive comments and a curious method of concatenating code may leave novice users bewildered. But for its cost, the software provides easy tools that code-shy designers will appreciate. We have to wonder, though, how many small web design agencies are making a living from the instant, generic results.

SOFTIDIOM WEBSmith 2

INFORMATION

PRICE \$195 (approx £107)
SUPPLIER Softidom 01223 31 4855
INFO www.softidom.com

REQUIREMENTS

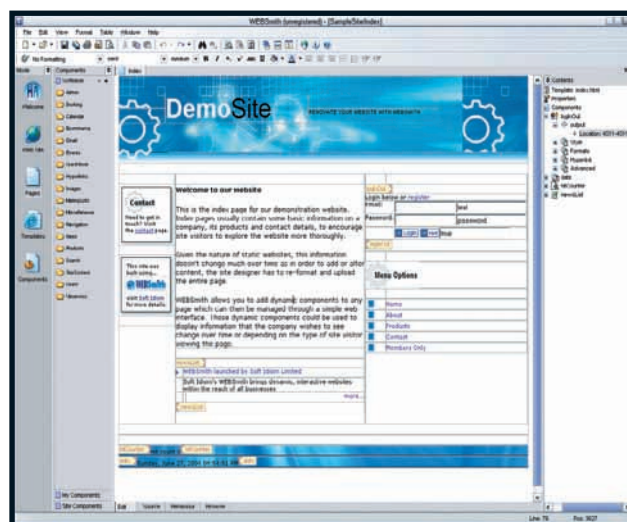
CPU 800MHz Pentium II
RAM 256MB
OS Windows 98, 2000 or XP

WEBSmith is the relative newcomer to this Lab Test, from British developer Softidom. Sporting an unusual interface, the title takes some getting used to, although comprehensive documentation and online support are available which help bring you into the WEBSmith fold. The main selling point, is you can create and integrate more dynamic, data-driven content into either a new or existing site, with little or no knowledge of what is actually going on under a site's bonnet.

As with NetObjects Fusion, much of the initial planning is achieved through a series of wizards that enable you to determine the structure and basic content of a site. But in addition, WEBSmith provides options that focus more on technical aspects that are often beyond the average web designer, including dynamic elements such as user registration, product catalogues and guestbooks through the initial configuration.

Once a page has been created, WEBSmith can be used to drag and drop components in place to allow further code-driven features to be added. These components range from basic hyperlink and image options through to e-commerce and online booking forms. Again, the unusual interface means that it takes a while to become familiar with what's on offer.

With its integrated local web server, the application certainly makes the creation of database-driven content a much easier task, although we did find manual editing a bit temperamental, with little control over more accurate positioning. However, as the application can quite happily enhance previously designed sites, we'd assume that it is



A non-standard interface gives Softidom WEBSmith a rather steep learning curve. However, the supplied documentation and online support soon explain the logic behind it.

better suited to providing support for designers who need to integrate dynamic elements into their existing work, rather than using the program as a primary layout or design tool.

Despite its obvious strengths, we felt that WEBSmith was generally let down by its non-standard interface and logic, that will leave many users frustrated as they yet again turn to their manual for explanation. However, if the next version takes on such improvements, we could have a serious web authoring contender on our hands.

PCPlus ratings

SOFTIDIOM WEBSMITH 2

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 7

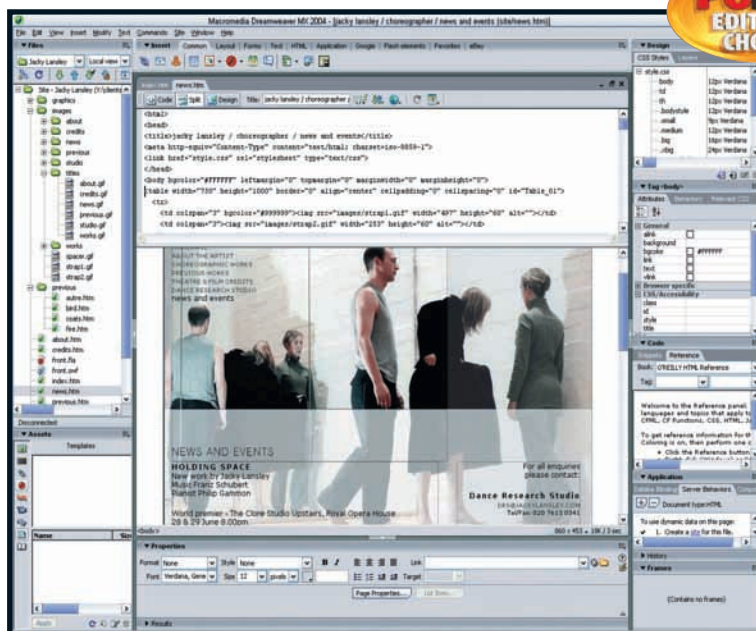
MACROMEDIA Dreamweaver MX 2004

INFORMATION

PRICE £339 (£289 ex VAT)
SUPPLIER Macromedia 0131 458 6766
INFO www.macromedia.com/uk

REQUIREMENTS

CPU 600MHz Pentium III
RAM 128MB
OS Windows 98SE or later



With its comprehensive range of tools and features, Macromedia Dreamweaver is by far the most popular tool of choice.

In many respects, there is no argument over the qualification of our winning title. Macromedia Dreamweaver has long been the preferred application throughout the web design industry, with a long history of key enhancements being introduced throughout its seven generations. But the most far-reaching improvement, was the integration of its dynamic authoring cousin UltraDev when the MX range was originally announced.

UltraDev was originally developed from a little-known application called Drumbeat, before being acquired by Macromedia, which quickly went about turning it into a more specialised version of its Dreamweaver title. But rather than continue parallel development of what were effectively twin applications, Macromedia decided to merge the strengths of the two leading packages to make the original Dreamweaver MX a formidable web authoring solution.

In addition to this, the Macromedia take-over of Allaire provided the company with its popular HomeSite raw HTML editor – of which many time-saving features are now available directly when working on code within Dreamweaver. Such features include intelligent tag and attribute completion, which ensures that less time is spent typing out those pointy brackets and more real work gets done. And, of course, support for Allaire's ColdFusion title really helps to expand the dynamic potential, too.

Such workflow improvements increase the power behind Dreamweaver enormously, although many design-based authors can end up feeling a little left behind. But with code snippets available that enable common navigation, meta content and form elements to be simply dragged and dropped in place, even the most code-shy pixel-pushers will find themselves stretching their potential. And if such features inspire users to explore the mysteries of dynamic content, then the comprehensive reference documentation helps to explain the intricacies of 11 different methods. These include all the familiar formats, from HTML, JavaScript and CSS to PHP, JSP and ASP, and then on to SQL, ColdFusion and general accessibility issues.

Dreamweaver's main strengths, though, are to be found in its design options. Being able to work equally with design and code through the split-screen feature has led the way for many of the titles we've looked at here alongside Dreamweaver, but it was the quality of the code that really helped it to stand out from the crowd. While FrontPage suffers from bloated code, GoLive provides quirky formatting

and Fusion fills things up with comments, Dreamweaver still provides clean and recognisable code – making the transition from design to code views an easy task. With simple considerations taken into account, like being able to select an element in design view to have the necessary code highlighted, you begin to realise how much time can be saved.

Another aspect that marked Dreamweaver as an early leader in its field was the popular concept of Behaviours. Effectively, Behaviours were predefined JavaScripts; they provided certain specialised functions that individual users may find uses for, but which weren't deemed necessary to include in (and overcomplicate) a feature-rich application. Instead, users were offered the chance to head over to the Macromedia website, from where a growing library of such behaviours were freely available for download. Over the years, more and more users have created and made their own Behaviours available, and the range of options has grown to extraordinary levels to cover virtually every aspect of web design, from basic scripts that open an external browser window through to fully functional search engines, shopping carts and content management systems.

New features incorporated within the current MX 2004 title also include improved CSS support, which finally makes the control and management of important layout controls easier and more immediately accessible within both the application and developing pages. The code-editing environment now takes full advantage of the benefits provided by HomeSite, with right-click contextual options providing advanced find and replace options, auto validation and customisable syntax colouring.

The interface has been revised to cater for the growing number of palettes, which can be hidden or viewed easily and intuitively and, of course, there's improved integration and natural native recognition of related technologies, such as Macromedia Flash and Fireworks, for creating and editing animated and graphic content.

Dreamweaver has by far the most potential of any of the applications we've examined, and it offers the most creative freedom for both designers and developers. Although some creatives may prefer the Adobe approach and the GoLive package, and more corporate customers will tend to opt for the Microsoft option, there's no denying that Dreamweaver is the web authoring tool of choice within the professional design studio.

PCPlus ratings

MACROMEDIA DREAMWEAVER MX 2004

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	9

Specialised web production tools

Build up your software toolkit with a few specialised applications and extend your web authoring capabilities

All of the titles considered in our Lab Test provide the tools and features you'll need to create impressive dynamic online content. With integrated ftp clients, asset management options, template support and design tools, you may think they provide the web authoring equivalent of a Swiss army knife. In many respects you would be right, but to rely solely on one package would be to dismiss the specialised tools available – which may allow more immediate access to certain aspects of authoring and development.

For example, prior to the current Dreamweaver MX 2004 version, the Macromedia title had the quirkiest way of handling CSS data, involving a vague wizard approach that most coders found frustrating. The current version is much improved, although a dedicated application such as Bradsoft TopStyle Pro (www.bradsoft.com) will provide the ultimate control. Created by the original developer of the HomeSite HTML editor, the tool is simply the most featured CSS editor available.

Talking of HomeSite, there are still many old-school coders who proably find staring at lines of pointy

brackets the only way to create web content. GoLive and Dreamweaver may provide excellent methods of working directly with the code, but users of the latter can all too easily overlook the HomeSite installation files tucked away on the Dreamweaver installation disc. With both HomeSite and Dreamweaver installed, you'll find you can make the most of both applications using Macromedia's round-trip editing to achieve the best results.

Dynamic content

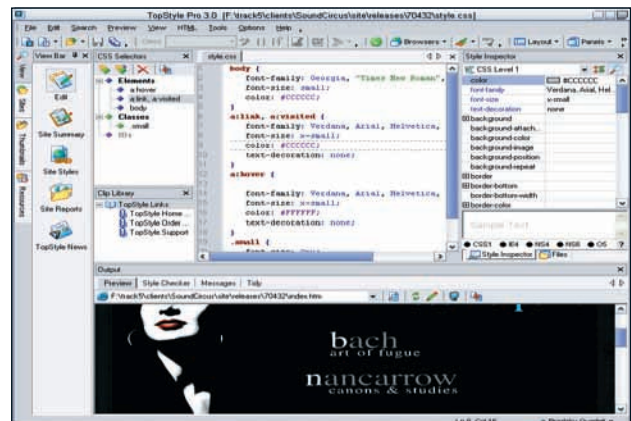
But generating dynamic content requires a few more features than just HTML and CSS. Server intervention is invariably required to process dynamic content, and without hosting you'll be hard-pressed to test your pages unless you install a local server. The most popular options here are Apache (www.apache.org), an open source application that can be freely downloaded, and Microsoft's IIS server which is available to XP Professional users by default, although a quick Google search will reveal where you can download a copy if you need to.

With a server installed, take full advantage of database connectivity using a (free) copy of the MySQL database server (www.mysql.com). While you have your browser open, head over to the official PHP site (www.php.net), from where you can grab source code and documentation on the popular scripting language. If all this sounds too technical, then you may prefer to get hold of EasyPHP (www.easypHP.org) which groups together the Apache server, a MySQL database, a fully PHP execution and various development tools that will ease you in more gently.

It's also advisable to download all the current browsers. Microsoft may have won the browser wars, but previewing your work through recent versions of Netscape, Opera and Mozilla will ensure that you're aware of any potential compatibility issues before your audience is. And although all the applications being considered incorporate their own ftp clients, you should check out some dedicated alternatives such as WS_FTP (www.ipswitch.com) or Cute FTP (www.cuteftp.com) to gain easier access to content below the root of your remote site. ■



Many additional tools are freely downloadable, such as EasyPHP (www.easypHP.org), which provides server and database functionality.



Bradsoft TopStyle Pro offers an excellent dedicated alternative for managing CSS content, and if you're not using CSS, why the hell not?

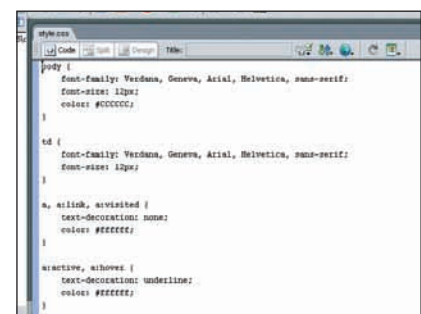
Cascading Style Sheets

Take control of your site's design by slipping between the sheets with CSS

Any self-respecting site author will make use of Cascading Style Sheets (CSS) to manage the appearance of a wide range of elements – from text formatting to entire page layout – instead of outdated methods such as the tag, which only serves to bloat file size.

CSS works by linking documents through a simple line of code within the <HEAD> of an HTML document to an external CSS file. This file contains defined attributes for such elements that might determine the size, colour and font face used with text, for example, on any page that links through to it and not only disposes of the outdated font tag, but also enables you to make global changes to your site quickly and easily.

Without CSS, making such changes would mean that each and every HTML file would have to be opened in turn, with every instance of text having to be updated. CSS enables us to simply edit a few variables within a single file that instantly applies to an entire linked site. Dreamweaver and GoLive have by far the most intuitive control over any associated CSS files your site may rely on, although making use of dedicated tools such as Bradsoft TopStyle Pro (www.bradsoft.com) will help you edit the raw code efficiently, while keeping you informed of what is possible within a particular command. It will also provide dynamic previews of how your changes might appear on the actual page. ■



CSS employs a simple syntax that is easily identifiable, although most web authoring applications will manage them automatically.

PCPlus Verdict

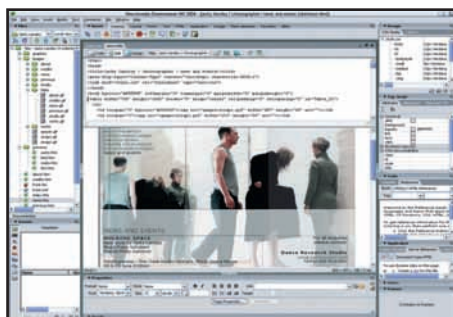
Macromedia's Dreamweaver triumphs yet again.
But is it the right package for the way you work?



EDITOR'S CHOICE

Macromedia Dreamweaver MX 2004

PRICE £339 (£289 ex VAT)
SUPPLIER Macromedia 0131 458 6766
INFO www.macromedia.com/uk



Boasting a huge feature set and an easy-to-use interface, this is the most persuasive option on test. Usable templates will help the new web author create their first site; advanced users will appreciate the support for all the major web languages. With natural links to Macromedia Contribute you can ensure that authors who need no more experience than using a word processor can update content. Behaviours ensure the software is constantly pushing boundaries so that your site remains current.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

ANALYSIS

The way the web works is changing. Thankfully, so are web packages...

The secret of producing a successful web authoring application is through a balance of flexible technical capabilities and creative design options. Those programs which enable the user to get results intuitively will clearly have the advantage over their rivals.

Dreamweaver has a good track record of balancing these aspects, with a natural evolution of upgrades that have enabled long-term users to build on their skills as both the software and technology develop. Why GoLive hasn't been as successful is arguably down to Dreamweaver's extensibility through its Behaviours, although in many respects the Adobe title is just as capable. Its failing, is that it didn't capture the creative imagination early enough.

Another advantage both programs enjoy is their close relationship with industry-standard tools: GoLive finds natural links with Photoshop, ImageReady and InDesign; Dreamweaver falls into the same camp as Flash, Fireworks and Contribute. FrontPage, on the other hand, has equally strong links with the ubiquitous Microsoft Office suite, although the lack of creative options and the bias towards MS servers and browsers means it has failed to find an appreciative pro user base.

The wizard approach and oversimplification of NetObjects and SoftIdiom titles may find favour with the more casual author, and although some impressive results are possible, it is the lack of immediate control over what is actually going on under the bonnet that ultimately leads to such titles slipping into the 'also-ran' category.

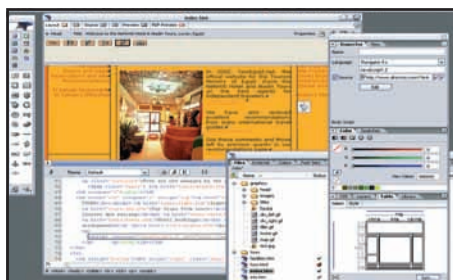
With the web design gold rush now behind us, we can see some mature and established titles available for creating and updating web pages. All of these are expected to edit static web content, but also to allow asset management, ftp access and dynamic content generation. To varying degrees, all five of the web authoring programs we've assessed manage this quite easily. However, there's no doubt that Dreamweaver will continue to lead the market for some time to come.



PERFORMANCE AWARD

Adobe GoLive CS

PRICE £394 (£335 ex VAT)
SUPPLIER Adobe 0870 606 0325
INFO www.adobe.co.uk



With its close links to related Adobe Creative Suite titles, GoLive is the natural choice for the designer. Photoshop and its associated web graphic application ImageReady provide such users with the ultimate methods of creating original designs – all of which can be sliced into functional web pages that GoLive will subsequently develop into more dynamic online content.

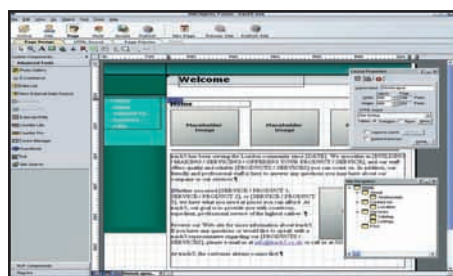
PCPlus verdict 1 2 3 4 5 6 7 8 9 10



VALUE AWARD

NetObjects Fusion 8

PRICE £120 (£102 ex VAT)
SUPPLIER Amazon www.amazon.co.uk
INFO www.netobjects.com



At a third of the price of the heavyweight applications, NetObjects Fusion 8 proves to be excellent value for money. Although it may be too reliant on predefined templates, these can be easily modified. For the coder with limited design skills, the options the software provides will enable you to create an impressive initial site that you can continue to modify quite easily.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

PCPlus HARDWARE LAB TEST

→ We road-test 10 all-in-one wireless routers



Dan Grabham

dan.grabham@futurenet.co.uk

'Wireless G' keeps thinking he should find a new specialist subject. Wireless networking is taking over his life

One box wonders

Why buy a wireless access point when ADSL modem and router combos are on offer? Dan Grabham believes in the 'all-in-one'

We've extolled the benefits of wireless networking in recent issues of PC Plus, but when it comes to the practicality of going wireless in your home, there's one essential piece of kit: the all-in-one (AIO). These gadgets combine a wireless access point, ADSL modem and wired Ethernet ports to provide you with a standalone solution to sit at the centre of your home network and effortlessly share a broadband Internet connection. They also provide you with a hardware firewall to ensure that you're not only relying on software firewall technology to prevent net attacks.

One-box ADSL modem routers are an ideal solution for homes or small businesses, enabling you to separate your wireless and Internet connections from your PC. Why should this be important? Most ADSL

starter packs feed the broadband connection directly to your PC via a cheap USB modem. This is all very well, but sharing your broadband connection over wireless requires an access point to be connected to the Ethernet connection on the back of your PC. Again, this sounds fine in principle, since if you have Internet Connection Sharing enabled in Windows XP you'll have few problems sharing your connection. But it does mean that you'll need to have your PC switched on when you want to dish out your net connection to other resources, and this is hardly convenient.

In short, these AIO boxes are an ideal one stop networking solution. They're relatively inexpensive, yet can provide you with all the flexibility you'll need. We've scrutinised ten of the best all-in-ones on the following pages.



Editor's Choice

Our top award for products that combine exceptional performance and quality with superb value for money



Performance Award

Awarded to products that excel in our performance and quality tests, where money is less important



Value Award

Awarded to products that represent outstanding value for money, giving you more bangs per buck

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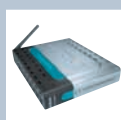
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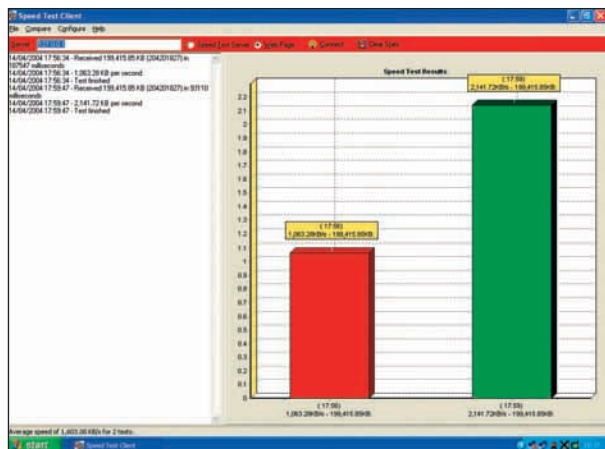
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How we tested

It's not just all about the network performance – you need to look at the feature set to assess these devices, too...



Assessing these modem, router and wireless access points was never going to be easy – for two reasons: firstly, many of them are extremely similar; secondly, they all do a lot besides pipe broadband over a wireless network.

So let's start with the basics we can disregard. All the devices here are 802.11b and 802.11g compatible. They all have MAC address authentication and WEP encryption as security standards. They all have four wired Ethernet ports for wired networking. So we're going to have to look deeper than that. We tested the boxes by hooking it up to a home ADSL connection. Sounds simple, doesn't it. Sadly, many of the devices had

just didn't work.

We then used each box at the centre of a home network, using a Dell PC with a SMC 802.11g PCI card. Here, we noted any problems with connection speeds. Even though 802.11g doesn't operate anywhere near the cited 54Mbps, we can see if the signal has dropped at all to 22 or even 11Mbps. We also saw whether the signal dropped out at all.

After that, we then tested each box's speed and throughput in harsh conditions. There's no better place than the PC Plus office for this; several wireless networks and cordless phones (which also use the 2.4GHz frequency band) vie for the

The SpeedTest app assessed data transfers (in this case a 100MB zip file) between linked computers.

poor setup instructions or options and we've pointed these out in each case. All-in-one devices are designed to make wireless networking simpler, not leave us clenching our fists – thanks, US Robotics. All the devices also used simple browser-based configuration interfaces, so we were also able to check these for poor quality or, in one case, the fact that it

same airspace. There's also an awful lot of other kit just waiting to cause problems for our wireless signals. As you'll see, this dramatically decreased the performance of many of these routers.

As in the wireless networking Lab Test in PC Plus 217, we also used NetIQ's QCheck (www.qcheck.net) to send 1,000KB packets of data across our network between two Belkin PC Card adaptors. We then used Raccoonworks SpeedTest (www.raccoonworks.com) to time the transfer of a 100MB Zip file across our network.



NetIQ's QCheck tested the average throughput.

3COM Office Connect 3CRWE754G72-A

INFORMATION

PRICE £94 (£80 ex VAT)

SUPPLIER www.dsl.warehouse.co.uk
0870 162 0800

INFO www.3com.co.uk

WARRANTY Limited lifetime

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64/128bit WEP encryption, WPA support, MAC address filtering, IP addressing

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

As its name suggests, 3Com's entrant is a focused business proposition. It's also an exceedingly good example of an all-in-one (AIO) at its best. Combining stonewall business features with user friendliness, it's the ideal solution for a small company where a broadband connection is shared between three desks. Wireless brings a new dimension to environments such as these, since it's now perfectly possible to wirelessly connect all the computers within a few minutes, and without the logistical nightmare of a wired network.

3Com has utilised Intersil's PRISM GT Wireless chipset. Intersil claims its Wireless System-on-a-Chip, or WiSOC as it's otherwise known, is the world's most sophisticated access point chipset as there's no need to have a separate network processor. There are supreme security features included here: as well as a firewall, you also get hacker pattern detection and the ability to filter out access to individual URLs. While many ADSL routers have some of these features, they rarely have such high levels of configuration.

As a router, it's also top notch, with the ability to specify which ports have



to be left open for certain applications, as well as routing specific external Internet calls through specific ports. Another feature that's becoming more common is the router's ability to set up web filtering rules and block specific websites. These are now as easy to use as any parental control software on the web. There's also the added bonus of VPN support.

We weren't that impressed with the level of throughput – the router took over 94 seconds to transfer our 100MB test file. But the 3Com does do well in terms of overall wireless signal, which was strong right across our office. The

slightly lacking throughput is surprising given that the router is designed for use in offices where several machines will be trying to squeeze themselves onto the network. Mind you, this is a slight misnomer given the bandwidth restrictions of a broadband connection.

Installation and configuration is the best aspect of the 3Com, though. The browser-based configuration is the finest we've seen; no baffling of its customers with endless setup screens. And, with a PC Card currently being thrown in for the £94 price, it means that the package represents even better value for money.

PCPlus ratings

3COM OFFICE CONNECT 3CRWE754G72-A

Value ○○○○○○○○

Features ○○○○○○○○

Performance ○○○○○○○○

OVERALL 8

BELKIN F5D7630-4A

For such a good product, Belkin's AIO box is confusingly named. We think Belkin probably intended to make things simpler by describing it as an 'ADSL modem' with a built-in router, but it seems to have got in a bit of a twist somewhere along the line. Make no mistake: this is an 802.11g Wireless Router first, with a built-in ADSL modem second. Many routers are now branded with the word 'broadband' when, in fact, they're nothing of the sort – no ADSL modem has actually been crammed inside the casing, but any attempt to make things even slightly clearer should be applauded.

The Belkin all-in-one breaks other conventions, too. On price it's unbeaten, and in terms of colour... well, it is rather strange. Performance also finds the Belkin router in the top tier, and we found it to be one of the most impressive we tested. It uses Broadcom's technology just like many of the other devices we've looked at here – such as the impressive Linksys WAG54G (page 108).

And if that wasn't enough, we also like the documentation supplied with the device. Setting up a broadband configuration is easy – sadly this isn't the case with many of the other



devices on these pages. A deeply comprehensive 'Start Here' booklet is included and, unlike some of the other manufacturers' start-up wizards, Belkin's actually works. Admittedly, that is what you would expect it to do, but you would be surprised.

You might have the best performing all-in-one on Earth, but it's no good if whoever's bought it can't set the thing up. So it's a relief to find that, in place of comprehensive IP address configuration there's the ability to auto-detect your connection, type in your username and password and then connect to the Internet immediately. The ability to fine-tune your connection

is essential, but why bombard the user with information they really don't need to be fiddling with at the outset?

As you would expect, security is also well catered for and, in addition to the basics, the Belkin features the increasingly popular Network Address Translation (NAT). NAT means that multiple users connecting to the router share a single external public IP address. In other words, it protects your individual PC from network attack. All-in-all, it's a comprehensive package. Price has become a major driving factor with all-in-ones, and this Belkin product is a bargain over £25 cheaper than the Netgear model (page 109).

INFORMATION

PRICE £73 (£62 ex VAT)
SUPPLIER www.dabs.com
INFO www.belkin.co.uk
WARRANTY Limited lifetime

SPECIFICATION

TYPE ADSL modem, router and access point
COMPATIBILITY 802.11b, 802.11g
FREQUENCY 2.4GHz
OPERATING CHANNELS 13
SECURITY 64/128bit WEP encryption, MAC address filtering, SPI firewall, NAT support
CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

PC Plus ratings

BELKIN F5D7630-4A

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	9

COREGA BAR-AWLA-54

The Corega is, unfortunately, the polar opposite of the Belkin. There's little to inspire here, since the feature set is fairly standard. Indeed, the only thing that stands out on the spec sheet is IPSec. This technology enables the Corega to partner with other compatible devices that access the Internet and it acts to guarantee the integrity of the data packets it sends across the ether. It also supports VPNs so you can access your corporate network when working remotely. This is useful, but it won't make a huge difference to most people. If, however, you do need it, plump for 3Com's option instead.

The Corega's setup process is fairly straightforward, but it doesn't inspire confidence when you see the browser-based interface. We're not saying it needs to be anything special, but it does resemble a website from the mid-1990s. Still, there's nothing wrong with that; it's nicely categorised, dispensing with some of the fancier and superfluous interfaces designed by other wireless manufacturers.

Unlike some of the other all-in-ones we've featured here, you can just plug Corega's kit in and the wireless



network will be instantly operational, even if your ADSL connection won't be.

We were reasonably impressed by the speed of throughput, but bizarrely this isn't reflected in the 89 seconds that it took to transfer our 100MB file. As far as wireless performance went, we were also impressed with the robustness and consistency of the signal; we didn't get any problems with drop-out as we did with other all-in-ones on these pages; notably the Netgear DG834G.

However, security is slightly lacking here; there's no support for the Wi-Fi Protected Access (WPA) standard, even

though the device has the usual MAC address filtering and WEP encryption at the usual 64 and 128 bits.

So, while it will serve the purpose well enough, the Corega is very uninspiring. You'll find little reason why you should plump for it over some of the other models. In fact, it's a bit like a Seat car – they are fantastic cars, it's just that people would rather pay a couple of grand more to get virtually the same vehicle, but with a Volkswagen logo. If the Corega cost £65 it would be just what the doctor ordered. But it costs that little bit more and doesn't offer anything special.

INFORMATION

PRICE £85 (£72 ex VAT)
SUPPLIER www.ebuyer.com
 0870 467 0753
INFO www.corega-international.com
WARRANTY Two years

SPECIFICATION

TYPE ADSL modem, router and access point
COMPATIBILITY 802.11b, 802.11g
FREQUENCY 2.4GHz
OPERATING CHANNELS 13
SECURITY 64 and 128bit WEP; MAC address filtering, SPI firewall, URL filtering, integrated VPN
CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

PC Plus ratings

COREGA BAR-AWLA-54

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	6

D-LINK DSL-G604T

INFORMATION

PRICE £94 (£80 inc VAT)

SUPPLIER www.microdirect.co.uk
0870 444 4456

INFO www.dlink.co.uk

WARRANTY One year limited

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11g, 802.11b

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64, 128bit WEP encryption, MAC address filtering, WPA support, firewall, IP addressing

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

Our first impressions of the D-Link device was that it behaved like the best all-in-one devices. Simply plug it in and, a few seconds later, the built-in DHCP server is ready to dish out IP addresses to any piece of hardware that wants to connect to it.

Once configured – and more on this in a moment – the D-Link is an erstwhile performer, with all the usual refinements you would expect, such as a built-in firewall and other security features, wired Ethernet ports and 802.11bg compatibility.

The included instructions are initially excellent, even telling you how to ensure the wired or wireless network adaptor in your computer can pick up an IP address from the network automatically. This is merely assumed in other guides. However, this guide tells you how to use the web configuration utility before it's told you how you can connect to the router in the first place. For the beginner, this can be slightly confusing.

The configuration interface is designed differently to everybody else's, featuring a smart tabbed appearance. It's a good solution and navigating your way around the



interface is straightforward. There's also a rather clever feature that displays your system uptime. However, the interface does get confusing when it has two menu options on each tabbed page that do the same job.

Much more confusing is how you enter in your ISP username and password. Like Linksys' device there's a lot of fuss over different connection protocols such as PPPoE and PPPoA. But unlike Linksys' documentation there are no precise UK instructions about how to set up your router. The instructions bang on about PPPoE when, in fact, we use PPPoA in the UK.

What's worse is that other values, such as the VPI and VCI figures, were not defined properly in the configuration utility – we had to look at the Linksys setup guide to get it all working. For most users, this would require a call to D-Link to sort it out.

Our initial burst of enthusiasm at the D-Link now appears misplaced. It's not much better when we consider the look and feel of the device either. Those turquoise patches are horrid, while the unit feels cheap and light. But don't let that alone put you off; the setup difficulties – even though it's a capable device – are quite enough to do that.

PCPlus ratings

D-LINK DSL-G604T

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL ●●●●●●●●●● **6**

LINKSYS WAG54G

INFORMATION

PRICE £93 (£79 ex VAT)

SUPPLIER www.itchest.co.uk
0870 162 0840

INFO www.linksys.com

WARRANTY Three year limited

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64, 128bit WEP encryption, MAC address filtering, firewall, parental controls, intrusion control, NAT compatibility

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

As we said in our original PC Plus assessment of this device, Linksys was very late to market with it. Thankfully, the extra time was put to good use, as this is one of the best AIOs on display. It's odd that Linksys should take so long to produce this device; especially since it was first to market with much more specialist products, such as the Wireless-B Media Adapter for streaming pictures and music to your TV and hi-fi, as well as a purpose-manufactured wireless bridge to connect your Xbox or PlayStation 2 to your wireless network.

Performance is also good – during long-term testing we found no wireless signal drop-out problems, but the Linksys performs well generally. This could be, in part, due to our tests being carried out with a Belkin card, based on the same Broadcom technology.

What especially impressed us was that there was only around a 40 per cent drop-off across the length of our large open plan office with all its interfering electronic equipment, not least several other wireless networks.

When we first started looking at this model, we were a bit dismayed that



the browser-based interface was over complicated, with too many configuration options on one screen. However, as we looked at the manual, it became clear that Linksys has actually got it cracked. The quick setup manual is specific to the UK – not one of the multi-lingual inch-thick guides found in others – and UK ADSL settings. This is a definite problem with other manufacturer's products – see our review of the Sitecom AIO on page 109 – and we often found ourselves referring to Linksys' set up instructions to set up other all-in-ones!

Generally, the browser-based interface is easy to use and navigate for even the most novice of users. However, the fact it appeals to novices doesn't give Linksys the licence to finish the WAG54G in such a hideous shade of blue. The whole idea of an AIO device is convenience, which is bound to appeal to rather more wireless unsavvy users. This is obviously not what Linksys had in mind when designing its grotesque colour scheme. Still, it's a small moan – the Linksys rates very highly on our radar – one of the best.

PCPlus ratings

LINKSYS WAG54G

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL ●●●●●●●●●● **8**

NETGEAR DG834G

We'll be honest from the outset. This is the kit that your reviewer uses at home. And for good reason since, it's been the king of AIO modem, router and wireless solutions. It earned our Editor's Choice award last year. But, as we all know, times change and, as we're seeing time and time again in this Lab Test, other devices have caught up in most, if not all, of the areas that it previously excelled in.

But using this device over an eight month period has proved that it's one of the best all-round AIOs. However, it does have one small problem: signal drop-out. This is a common problem with wireless kit, and can often only be resolved with a router reset. We've used all the AIOs on these pages over a period of time, but we haven't found it happens more often with the DG834G.

However, this is a relatively tiny gripe. It's still out in front in one area: aesthetics. It's a stunning looking device, even if it's the size of a squashed dinner plate. Netgear obviously had a few problems fitting everything into such a flat box, so it's wider instead. You might not think style is very important. Fair enough. But all-in-ones are central to the idea of the



wireless home. Would you really want the Linksys sat prominently in your living room? Thought not...

A time of 82 seconds to transfer the 100MB archive is hardly the best, but it's perfectly decent. Throughput, too, was decidedly average. The DG834G is also very ready to drop in speed when connecting adaptors from other manufacturers, even if they're 802.11g compatible. This isn't what you would expect, and is annoying in the extreme. Unfortunately, it appears you can't just change the configuration to 802.11g only, either, since then you tend to get connection problems.

Mind you, security-wise, the DG834G is as solid as a rock and boasts one of the most useable browser-interfaces around – even if we initially couldn't find where to configure the MAC address authentication.

Cost is now a major bugbear for the DG834G. When we first looked at it, it cost £120. As we've shown here, you can now pick it up for £100. But it's no longer competitive on price. There's now no real reason – apart from the striking appearance – not to save £25 and buy the Belkin. Go on Netgear, drop the price and we can say you've won again.

INFORMATION

PRICE £100 (£85 ex VAT)

SUPPLIER www.dsl-warehouse.co.uk
0870 162 0800

INFO www.netgear.co.uk

WARRANTY Two years limited

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64/128bit WEP encryption, MAC address filtering, SPI firewall with intrusion control

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

PCPlus ratings

NETGEAR DG834G

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 8

SITECOM WL-108

Sitecom doesn't seem to be able to make its mind up as to what to call the WL-108. The box describes it as the 'Sitecom WL-108 Wireless Network Broadband Home Station', but fortunately a simple search for 'WL-108' on Google will yield satisfactory results.

If the name isn't enough to give you the jitters, then wait until you see just how plasticky it is. It doesn't really inspire confidence and, while it's not badly made in any way, it doesn't exude quality, either.

During use it also gets rather hot. Most of the AIOs get slightly toasty, especially the metal-bottomed Belkin, but this thing is boiling after it's been plugged in for only a few hours. Strange – but not as strange as the procedure to set the thing up. Sitecom has tried to make it easy, but the plan has definitely gone astray somewhere. The setup wizard asks you in which country you live. On selecting 'United Kingdom' you're given the option of choosing 'BT' or 'Other' as your ISP. This is simple enough, but choosing 'Other' means you could easily end up configuring the router wrongly, as it asks for aspects of your ISP account



that it really should be able to determine for you. Then, confusingly, the router steadfastly refuses to ask for your ISP username and password.

We then tried using the BT settings. Again the router said the connection had failed. It's not at all intuitive, and the written instructions really do tell only half the story. Strangely, despite the router's protestations of our account not working, our email application managed to collect some emails! Still, on the next attempt, the setup worked without a problem and we were in. Sitecom has succeeded, though, in

making the browser-based interface simple to use. It's unfortunate that you might not be able to get that far. But, configuration issues aside, the WL-108 functions well enough, and performance is adequate.

Resellers also seem to be a little confused about how much they ought to be asking for the WL-108. Maplin (www.maplin.co.uk) saved the day, but we also found it at up to £40 more elsewhere. But even at £120, it's still expensive. That's nearly £50 more than the best all-in-one in this test. Enough said.

INFORMATION

PRICE £120 (£102 ex VAT)

SUPPLIER www.maplin.co.uk
0870 429 6000

INFO www.sitecom.com

WARRANTY One year

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64/128bit WEP encryption, MAC address filtering, firewall

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

PCPlus ratings

SITECOM WL-108

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 6

SMC Barricade G SMC7804WBRA

INFORMATION

PRICE £90 (£76 ex VAT)

SUPPLIER www.broadbandbuyer.co.uk 0190 832 9001

INFO www.smc-europe.com

WARRANTY Limited lifetime

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64/128bit WEP encryption, WPA support, MAC address filtering, SPI firewall, 802.11x

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

PCPlus ratings

SMC BARRICADE G SMC7804WBRA

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	5

Like the 3Com, this SMC device is a less consumer-orientated router and includes some business level features to match the billing. As well as the ability to block sites by URL or even by keyword, you can be alerted by email if a hacker has attempted to launch an attack on your network.

The Barricade also enables you to have greater control over many of the options and doesn't pretend to be able to ease you into the process of creating a wireless network.

SMC has also included support for PRISM Nitro, an enhanced wireless chipset technology, which is designed to boost your wireless signal over greater distances. Wireless chipset maker, Intersil has pioneered this technology and such small technological advances are rife in wireless networking at the moment. Different chipset manufacturers are vying to create technologies that it's hoped will be adopted and trounce everyone else's to become some kind of industry standard.

PRISM Nitro works through packet bursting technology and it can improve 802.11g networks, but is of more use on mixed mode networks such as



802.11b and g, where the inconsistency of standards usually slows down the rate of data transfer.

However, performance-wise this is the only thing which sets it apart from the competition – the 90 seconds taken to transfer our 100MB file certainly isn't the best, while data throughput speeds pretty much matched the results of the other routers tested.

What does set the SMC apart is the sheer amount of heat it generates. And we thought the Sitecom was hot! Most wireless routers do generate a bit of heat, but the base of the Barricade was hot, not just warm.

As with most of the routers on show here, you can just plug it in and use it as a wireless access point. However, we found that while the web-based interface is simple to navigate, it's not ideal for the wirelessly uninitiated; in our review unit there was no setup manual apart from on the CD.

Overall, the ancient-looking black box just doesn't inspire confidence; an impression that lingers. While it may be an excellent option for the small business, for home use it's just not quite there in terms of usability. We have to say that we would probably plump for the 3Com over the Barricade.

US ROBOTICSUSR019106

INFORMATION

PRICE £93 inc VAT (£80 ex VAT)

SUPPLIER www.savastore.com 0870 027 0900

INFO www.usr-emea.com

WARRANTY Two year limited

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY 64/128bit WEP, Wi-Fi Protected Access (WPA), MAC filtering, 802.1x authentication, IP filtering blocking and SPI firewall

CONNECTIVITY 4x10/100 Mbps Ethernet, 1xRJ-11 telephone jack

PCPlus ratings

US ROBOTICSUSR019106

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	5

US Robotics was extremely late to market with this AIO device, and it's only just been launched. It's worth remembering that this time last year we were talking about 802.11b all-in-ones, although we were only a couple of months or so away from most 802.11g devices hitting the market, and 'g' access points had been around for some time.

USR has never been a fan of 802.11g, mostly because of the company's American origin. Although they're coming round to it, the US wasn't in tune with 802.11g until Summer 2003, when they launched their accelerated 108Mbps wireless range, skipping over 54Mbps 802.11g kit. Of course, 108Mbps kit is compatible with 802.11g and 802.11b for that matter.

It seems USR realised the error of its ways and brought this 'g' device to market. It's just a shame they didn't use the extra time to bring us a brilliant AIO. Instead, this is a below-par device and it was the only piece of kit here to frustrate us constantly. When we first got the device, wireless networking was disabled. Not unreasonably, we wanted to enable it. So we turned to



the set up CD. Unfortunately, instead of making things a lot simpler, things became even more complex instead.

You have to click a button in the wizard to be able to access the wireless settings. This brought up a browser window but then, somewhat unfathomably, the page failed to load. It appeared to be something to do with the ActiveX controls in our browser, but we checked and the settings were fine. We even reset the router in an attempt to resolve our problem. So instead, we typed the IP address into the browser instead of running the set up wizard

from the CD. This went into the interface correctly, but it now showed that wireless was enabled. Quite how, we're still not sure, but it doesn't help that the interface is extremely flaky.

Not as flaky as the performance, though, which was also the worst in our test. It took 135 seconds to shuffle our 100MB chunk of data across the network. Yes, there's a comprehensive list of features; the IP filtering is especially good, for example. But it feels like corners have been cut. USR used to make networking kit to die for. Shame they've failed here.

ZYXEL Prestige P660HW-61

INFORMATION

PRICE £93 (£79 ex VAT)

SUPPLIER www.ssi-ltd.com

0193 547 4469

INFO www.zvxel.co.uk

WARRANTY Two year limited

SPECIFICATION

TYPE ADSL modem, router and access point

COMPATIBILITY 802.11b, 802.11g

FREQUENCY 2.4GHz

OPERATING CHANNELS 13

SECURITY WPA support, MAC

filtering, 802.1x authentication, NAT support, IP filtering and blocking and SPI firewall

CONNECTIVITY 4x10/100 Mbps

Ethernet, 1xRJ-11 telephone jack

PCPlus ratings**ZYXEL PRESTIGE
P660HW-61**

Value 1 2 3 4 5 6 7 8 9 10

Features 1 2 3 4 5 6 7 8 9 10

Performance 1 2 3 4 5 6 7 8 9 10

OVERALL **7**

ZyXEL make excellent networking products as a rule, and we were pleased to find that this foray into the AIO market doesn't disappoint.

It's another product aimed at the small business and comes equipped with a raft of excellent security features. Like most of the routers here, the ZyXEL supports the replacement security standard for WEP – WPA or 'Wi-Fi Protected Access'. Instead of WEP, which uses a single encryption key, WPA uses dynamically generated keys to reduce the chance of your data being intercepted. The browser-based interface enables you to completely configure the firewall, giving you the option to control not only what comes into your WAN from the Internet, but also what's allowed to travel back the other way. This is what ZyXEL does well, with a lot of user-configurable security features.

With a compatible ZyXEL ZyAIR G-160 Wireless PC Card the P660HW also offers something rather more interesting: 100Mbps capability. This is the only model here to offer such a feature, but it isn't going to be of any



benefit unless you buy the appropriate PC card, too. At the moment, it's not really advantageous to have this kind of speed, anyway. However, these kind of speeds can be more useful when multiple users access your network.

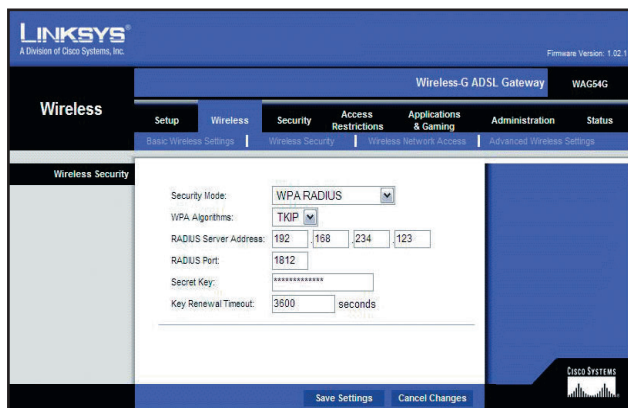
Set up is relatively painless, while the browser-based interface is also straightforward. Equally, the setup wizard also works unassumingly without a hitch even if, once again, you'll need to source the VPI and VCI settings yourself. The standard options should work with UK ADSL providers,

though. A nice addition to the setup interface is the ability to test your connection once you've put in the settings. Many of the models here don't do this, but it's handy to know that your settings work before you move away from the setup wizard.

For small business use, the P660HW is up there with the 3Com. It isn't as easy to use though; just because it's aimed at the business market doesn't mean it ought to be quite so complicated. However, the printed literature will get you started.

What's the idea behind 802.11i?

Yet another new standard has been announced by the IEEE, but what are the compatibility issues?



Late June saw the ratification of a new wireless standard, 802.11i. But, unlike the familiar 802.11a, 'b' and 'g' ratings for wireless speed, 802.11i is designed to improve security in wireless networks.

It's needed because the original wireless security devices, such as WEP (Wired Equivalent Privacy) weren't entirely up to the task and were found to be too easy for experienced crackers to intercept and decode. This has created two things; apathy towards wireless security – is there any point turning it on if it's easy to crack?

– and, secondly, the security concerns have also discouraged the use of wireless in corporate situations where sensitive data is being transmitted.

It's hoped that the 802.11i standard will improve wireless security to the extent that it could actually be considered for use where it's important that confidential information doesn't fall into the wrong hands – it's true to say that the numerous

security issues surrounding wireless networking have held back its use for serious corporate network applications.

The 802.11i specification is likely to be future-proof and compatible with the forthcoming second version of the WPA (Wi-Fi Protected Access) standard. Currently the first generation of WPA is still seeping into the consciousness of the wireless consumer and as such it's unlikely – and pretty unnecessary – that 802.11i should be used in the home. True, WEP is considered to be underpowered, but the first version of the

random key-generating WPA is more than enough for most wireless network security needs. WPA was instigated by the Wi-Fi Alliance when it became clear, in 2002, that 802.11i was going to take some time to arrive as a standard.

The 802.11i specification uses the Advanced Encryption Standard, or AES. This adds a second level of security to your wireless network and makes the possibility of using wireless in your corporate network a reality. Until now, it's generally been accepted that you should use an internal VPN to gain access to your corporate network even if you're simply roaming wirelessly in your office. AES meets the US Federal Information Processing Standard (FIPS) 140-2 specification, which is an absolute must for most government agencies.

Importantly though, will your kit support the new standard? The answer should be a yes, as new firmware from wireless kit manufacturers is rolling out as you read this.

Additionally, the Wi-Fi Alliance will be vigorously testing different manufacturer's equipment to ensure that they can interoperate using the new standard (all Intel Centrino integrated 802.11b and 802.11b/g compliant wireless adapters are compatible). Check the website of your manufacturer for any firmware advancements it may have released. ■

This month's contenders up close...

DETAILS					
Manufacturer	3Com	Belkin	Corega	D-Link	Linksys
Model	OfficeConnect 3CRWE754G72-A	F5D7630-4A	BAR-AWLA	DSL-G604T	WAG54G
Info	www.3com.co.uk	www.belkin.co.uk	www.corega-international.com	www.d-link.co.uk	www.linksys.com
Price	£94 (£80 ex VAT)	£73 (£62 ex VAT)	£85 (£72 ex VAT)	£94 (£80 ex VAT)	£93 (£79 ex VAT)
Supplier	www.dsl-warehouse.co.uk 0870 162 0800	www.dabs.com No phone sales	www.ebuyer.com 0870 467 0753	www.microdirect.co.uk 0870 444 4456	www.itchest.com 0870 162 0840
Warranty	Limited lifetime	Limited lifetime	Two years	One year limited	Three year limited
SPECIFICATIONS					
Standards supported	802.11g, 802.11b	802.11g, 802.11b	802.11g, 802.11b	802.11g, 802.11b	802.11g, 802.11b
Connectivity	RJ-11 telephone jack, four 10/100 Mbps Ethernet ports	RJ-11 telephone jack, four 10/100 Mbps Ethernet ports	RJ-11 telephone jack, four 10/100 Mbps Ethernet ports	RJ-11 telephone jack, four 10/100 Mbps Ethernet ports	RJ-45 telephone connection, four 10/100Mbps Ethernet ports
Firewall	Yes	Yes	Yes	Yes	Yes
WEP support	Yes	Yes	Yes	Yes	Yes
WPA support	Yes	Yes	Yes	Yes	Yes
IP Routing	Yes	No	No	Yes	No
VPN Compatibility	Yes	No	Yes	Yes	No
URL/IP filtering	Yes	No	Yes	No	Yes
Browser-based interface	Yes	Yes	Yes	Yes	Yes
TEST RESULTS					
Achieved throughput	11.958 Mbps	12.756 Mbps	13.136 Mbps	12.576 Mbps	12.678 Mbps
Time taken to transfer a 100MB file across our network	94.7 seconds	83.4 seconds	89.0 seconds	84.5 seconds	91.4 seconds
SIZE					
Dimensions (WxDxH) in mm	220x133x38	100x54x105	190x150x39	180x30x141	186x188x48
	PCPlus verdict 8	PCPlus verdict 9	PCPlus verdict 6	PCPlus verdict 6	PCPlus verdict 8

DETAILS					
Manufacturer	Netgear	Sitecom	SMC	US Robotics	ZyXEL
Model	DG834G	WL-108	Barricade G 7804WBRA	USR019106	Prestige P660HW-61
Supplier	www.dsl-warehouse.co.uk 0870 162 0800	www.maplin.co.uk 0870 429 6000	www.broadbandbuyer.co.uk 01908 32 9001	www.savastore.com 0870 027 0900	www.ssi-ltd.com 01935 47 4469
Info	www.netgear.co.uk	www.sitecom.com	www.smc-europe.com	www.usr-emea.com	www.zyxel.co.uk
Price	£100 (£85 ex VAT)	£120 (£102 ex VAT)	£90 (£76 ex VAT)	£93 (£80 ex VAT)	£93 (£79 ex VAT)
Warranty	Two years limited	One year	Limited lifetime	Two year limited	Two year limited
SPECIFICATIONS					
Standards supported	802.11g, 802.11b	802.11g, 802.11b	802.11g, 802.11b	802.11g, 802.11b	802.11g, 802.11b
Connectivity	RJ-45 telephone connection, four 10/100Mbps Ethernet ports	RJ-45 telephone connection, four 10/100Mbps Ethernet ports	RJ-45 telephone connection, four 10/100Mbps Ethernet ports	RJ-45 telephone connection, four 10/100Mbps Ethernet ports	RJ-45 telephone connection, four 10/100Mbps Ethernet ports
Firewall	Yes	Yes	Yes	Yes	Yes
WEP support	Yes	Yes	Yes	Yes	Yes
WPA support	Yes	Yes	Yes	Yes	Yes
IP Routing	No	No	No	No	Yes
VPN Compatibility	No	No	No	No	Yes
URL/IP filtering	Yes	Yes	Yes	Yes	Yes
Browser-based interface	Yes	Yes	Yes	Yes	Yes
TEST RESULTS					
Achieved throughput	12.140 Mbps	11.615 Mbps	12.403 Mbps	8.919 Mbps	12.925 Mbps
Time taken to transfer a 100MB file across our network	82.7 seconds	88.6 seconds	89.9 seconds	135.5 seconds	82.4 seconds
SIZE					
Dimensions (WxDxH) in mm	255x169x34	193x132x33	220x130x40	279x97x35	180x128x36
	PCPlus verdict 8	PCPlus verdict 5	PCPlus verdict 7	PCPlus verdict 5	PCPlus verdict 7

PCPlus Verdict

The competition for the best all-in-one is heating up – quite literally – but which three are the cool customers?



EDITOR'S CHOICE

Belkin F5D7630-4A

PRICE £73 (£62 ex VAT)

SUPPLIER www.dabs.com

INFO www.belkin.co.uk

WARRANTY Limited lifetime

So the Netgear falls from its previously lofty position at the top of the all-in-one tree. It's not that the Netgear has suddenly become bad. After all, the Belkin has a pretty identical feature set, but the Editors Choice award means value for money combined with top-notch performance. And, pound-for-pound, not only is the Belkin's low price point streets ahead of anything else here, but it's a



consistent performer, too – even though its stats aren't anything awe-inspiring. As well as ideal for your needs, it also appeals to the novice, as it's so easy to set up. It looks unassuming and feels solid. In short, there's currently no better combination of price, features, reliability and ease. Buy it. Now.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

ANALYSIS

We've tested our ten all-in-one routers, but why should you buy one?

Leaving the winners and losers aside, there's never been a better time to go wireless. If you want a wireless network, one of these all-in-ones represents your best opportunity to date, especially as they cost only an extra £10 to £30 than a conventional wireless access point. And, if you're thinking of holding out for the next wave of wireless technology – please don't bother.

Yes, it will continue to develop rapidly. But it's unlikely you'll get any advantage from this. After all, we've already seen access points which can offer, in theory, speeds of 108Mbps, but the ratified version of that speed – planned to be 802.11n – isn't likely until 2005. But, for what you might currently need to share your broadband connection for, there's no reason to wait to buy. And any new standard will be backwards compatible with the current standards available.

Indeed, this sector is only likely to grow as homes and businesses come around to the benefits of wireless networking and a broadband Internet connection. If you buy one of these now, you'll almost certainly still be using it in three or four years time – providing, of course, you don't exceed the numerous users that one of these devices can support. It's a bold claim in this industry. But it's unlikely you'll need to replace it because these all-in-ones are essentially designed to carry out a simple task – take your broadband Internet connection and dish it out to all the devices in your home. And, if you're thinking that bandwidth will be an issue, it almost certainly won't. After all, even given a throughput of, say 10Mbps that's still 20 times the bandwidth of a standard broadband Internet connection, while even faster broadband is some time away yet. The only area that 802.11g can't really cope with is streaming video. Compressed formats such as DivX function well, but we're not at the DVD-quality stage yet.

Of course, all-in-one devices represent part of the 'digital home' aspiration that Microsoft and others are trying to convince us is the future. The notion of separating your wireless connection away from your main PC might sound scary, and it's not what they tell you in wireless school, but you know it makes sense. An all-in-one is, without doubt, the best way to release yourself from 'cable city'.



BEST VALUE

3Com OfficeConnect 3CRWE754G72-A

PRICE £94 (£80 ex VAT)

SUPPLIER www.dsl-warehouse.co.uk 0870 162 0800

INFO www.3com.co.uk

WARRANTY Limited lifetime

As we had to give the Editor's Choice award to the Belkin, we now need to find a new winner, which gives everything for less. And, we have. As well as having a list of features as long as your arm, 3Com's OfficeConnect is reliable and easy to set up. It's not cheap, but for what it could give to a small business, it represents an extremely shrewd purchase.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10



BEST PERFORMER

Linksys WAG54G

PRICE £93 (£79 ex VAT)

SUPPLIER www.itchest.co.uk 0870 162 0840

INFO www.linksys.com

WARRANTY Three year limited

The Linksys' spec sheet doesn't show anything out of the ordinary, yet what the WAG54G does do is provide, not just a consistent wireless performance, but a smooth set up with excellent documentation and a usable, if slightly over-complicated, browser interface. That consistent performance raises it above the Netgear, which occasionally drops signal without reason.

PCPlus verdict 1 2 3 4 5 6 7 8 9 10

PCPlus HELPDESK

→ We solve your PC problems

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Paul Grosse and Wilf Hey continue with their tireless campaign to ensure that your software problems are tackled and solved

INTERNET

UK-oriented Internet explorer?

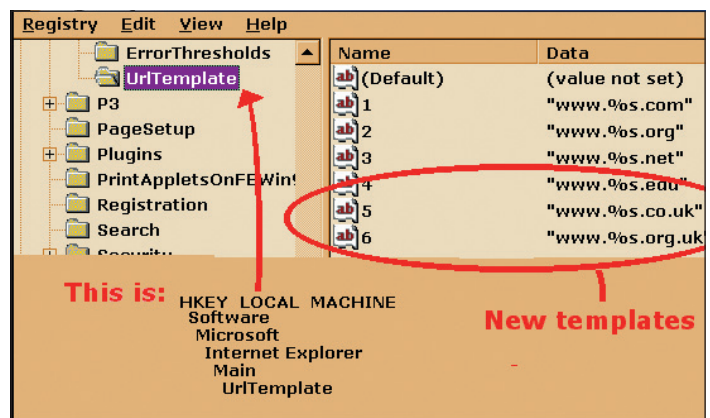
Q Is there a UK-oriented Internet Explorer? If I want to look up a website not knowing its full name, I type in the main part and IE will add on the necessary 'WWW' and the suffix '.COM' or '.ORG'. The version I have won't look for '.CO.UK' or 'ORG.UK'. Is it possible to get a UK version, or even a patch?
George Potter

A The rules for adding missed out parts of a URL are encapsulated within the Registry, and the necessary changes are quite simple. When you use REGEDIT, remember, it's important to back up the Registry beforehand. Using REGEDIT's left pane, navigate to HKEY_LOCAL_MACHINE\Software\Microsoft\Internet Explorer\Main\UrlTemplate. Note that the folder 'Software' is case-dependent and not to be confused with 'SOFTWARE'. This key has several values, all assigned numbers, which indicate the order in which they are tried. The string value in each is a template to tell what to add, with '%s' in place of the short form you try. You can supply your own additional template by right clicking on the right pane, clicking 'New' and 'String value' and Enter, then right clicking on the new string name, choosing 'Rename' and assigning it a distinct new sequence number and Enter. Then right click on it again, choose 'Modify' and key the new template itself – such as www.%s.co.uk followed by Enter. You can add more templates, delete others, and change their sequence numbers to modify the order in which they're tried.

INTERNET

Commando-style Explorer

Most Internet users designate an interface to their favourite search



Internet Explorer's nifty URL abbreviation feature is actually embedded in the system Registry, and can be modified to suit your own needs.

engine as their 'home page', reasoning that keying a search request is a common way of starting an Internet session. Many have found, however, that it's annoying to have to wait for the interface to load when search engine traffic is particularly heavy – especially if they're geared up to keying a specific URL instead. A trick commonly used is to create a simple local HTML page as a home page, which will be displayed immediately.

The good news is that you can effectively have the best of both worlds. Specify that the search engine is the 'home page', then copy the pointer to the Internet Explorer to a different location (on screen, or perhaps in the Start menu or one of its subfolders). Right click on that second pointer (icon or name) and choose Properties. From here, go to the Target field and add '-nohome' (without the quotes, and no space after the hyphen) outside the quotation marks to the right. Then be sure to change or delete the Shortcut Key that will activate it. It will be less confusing if you rename this second object so that you will know which one to choose – the usual, or this new 'naked' Explorer.

LINUX

USB drives

Q I have a physically small machine running Linux and the only drive bay has the original, rather small, drive in it. I don't want to replace this but add to it as it has all of my work on it. I would like to add a large, external hard disk drive using USB but all of the external hard disk drives seem to need partitioning with a Windows utility first – they all come with CDs full of Windows programs. Is there a Linux utility to partition disks or do I have to find a friend that has Partition Magic or a similar program that can partition and then format in a Linux file format?
Callum Astle

A This is all a lot easier than you would think and just to prove it, we installed a 160GB external USB hard drive on a Linux machine and assigned it to Network Storage (NAS) using Samba. Firstly, USB hard disk drives differ from USB flash drives in that you can format them. In addition to that, you are not limited to using FAT or NTFS, you can use any file system that you like, including Linux's journaling file

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HelpDesk welcomes questions, tips and follow-ups to published items, but please note that we can only respond via the pages of the magazine.



Paul Grosse
paul.grosse@futurenet.co.uk

Paul started helping people with their problems on the PC back in the 1980s, and programs for fun



Wilf Hey
wilf.hey@futurenet.co.uk

Wilf has been hanging around computers for decades now: you'd think that something clever would rub off on him



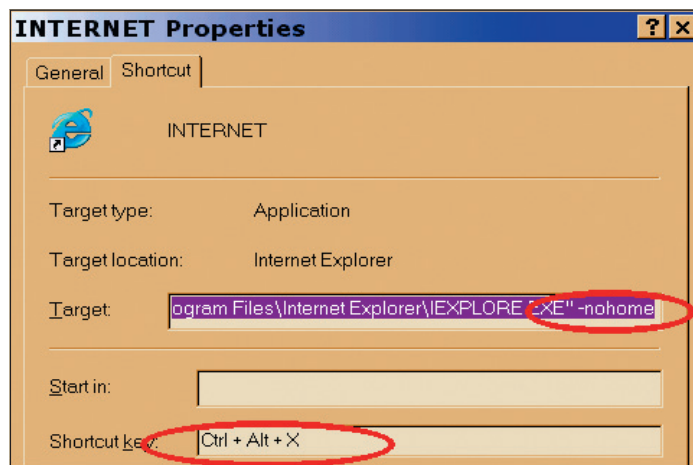
<http://forum.pcplus.co.uk>

system ReiserFS. We priced up some ready made USB HDDs and the individual parts and found that we could get 160GB if we assembled it ourself or 80GB ready made.

The installation is quite easy and trying to get the disk drive into the box took longer than preparing the disk electronically. So, with your disk in its USB box and plugged into your Linux machine, switch it on but don't mount it. Trying to mount it will make the system see it as something other than a block device and the mount will fail. Instead, go into the file manager and create a mount point. Our intent was to use it as another NAS so we created a directory called '/nas/nas_cache'.

Next, we went into the Control Center and under 'YaST2 modules', 'Hardware', 'Hardware Information' then, 'Disk', 'Storage Device', 'Resources', 'size', 'sectors', we found that even though the disk had never been written to by the system, we could see under 'x' and 'y' that the product of the numbers 321,672,960 and 512 came to 164GB (more about misleading SI prefixes on this month's SuperDisc). The system can now see it, so click on 'Close'.

Then, click on 'YaST2 Modules', 'System', 'Partitioner' and then click on the 'Yes' button. You have now found your way into a little gem of a program.



There are good reasons why you may want to launch Internet Explorer without immediately focusing on the designated home page. A few changes to the properties of a copy of the standard are all that is required.

Click on the 'Create' button and then choose the disk you want to create the partition on – here, I selected '2: /dev/sda' which is the external USB drive. Click on 'OK' and then select 'primary', clicking 'OK' again.

Now, we are onto the good bit. You can specify the mount point and format the partition you create with Ext2, Ext3, FAT, JFS, Reiser, XFS or swap. On a Windows machine, a 2GB FAT HDD takes several minutes to scan for errors after a dirty shutdown (a power failure for example) so for a large drive,

you should choose a system that is journaling such as ReiserFS. At that rate, an HDD that is in the order of hundreds of GB will take several hours to scan without a journal. If you want to use it for a webserver, downtime is critical, so again, choosing a journaling file system with its inherent quick recovery makes sense.

You can also specify just how big, how many and where you want the partitions to be on the disk so you can create a disk with the layout you want and format it. Whilst that might not ➔

WRITE IN

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HelpDesk welcomes questions, tips and follow-ups to published items, but please note that we can only respond via the pages of the magazine.

HELP US HELP YOU!

We get thousands of emails each month, so please send your messages to the correct address. Email SuperDisc problems to pcplus.support@futurenet.co.uk

But how about a 59 degree slope?

Made to measure inclines in MS Paint (Paintbrush)

No need to get out the old geometry books. When you know how, even the humble Paintbrush utility has a way of sloping lines from the horizontal to any needed number of degrees.

In HelpDesk for issue 217 (June 2004) we detailed a method you could use to draw an angle of 60 degrees easily within the basic painting program that comes with your system. Su Pilkington had emailed us with this interesting quest. We hammered out a method based on a few geometrical facts we were able to remember collectively from schooldays.

In turn we received several notes from readers who had their own

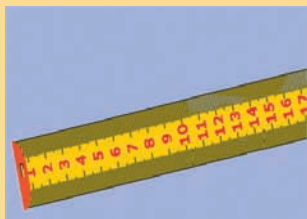
favourite ways to do the same thing, and each thought their method was easier. However in a 'Eureka' moment we thought of a trick that will make angles of any whole number of degrees, 1 to 89, and doesn't depend on our memory of Euclid or Pythagoras.

To produce a slope upward to the right at an angle of X degrees to a horizontal line, find a small blank area on the screen and draw a new horizontal line. When drawing a line, you can ensure it's horizontal by paying attention to the dimension figures at the right end of the bar at the bottom of the screen. It's perfectly level only when the second figure is 'x1'.

Now draw a selection box that includes some or all of that line. Key CTRL + W, then TAB three times down to the Skew.. Vertical field: key the number of degrees for the slope (such as 60). Now drag the resulting selection over to the place requiring the slope, position it carefully, then drop it. The line of the slope will be extremely narrow. If the slope is more than 45 degrees, make sure the horizontal line you use to produce it is two pixels thick to ensure no gaps are in the slope. For a slope of more than 63 degrees, more than three pixels, and more than 71, four pixels. This method only applies to horizontal lines, not shapes. ■

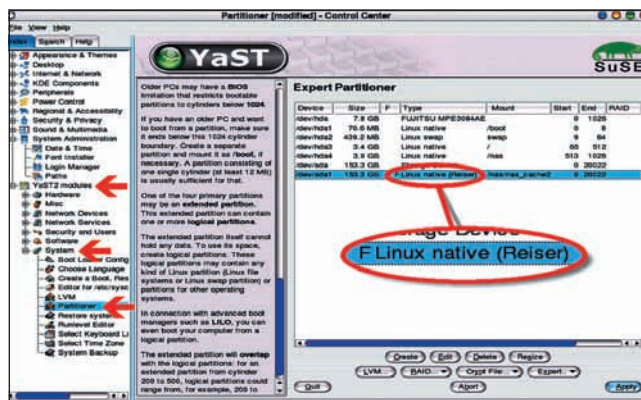


Even the humble Paintbrush utility has a way of sloping lines from the horizontal to any needed number of degrees.



TOP TIP

Take a fabric measuring tape, and with strong cellulose tape attach it along a convenient edge of a work surface near your computer – we recommend the thicker, tougher ‘weatherproof’ type. This provides a very useful and always available way to check on the size of paper or other objects.



You can partition and format an external USB hard disk with any file system using Linux. Here ReiserFS provides a nice journaling system suitable for a large drive.

sound too exciting, if a friend wants a disk partitioning for a Windows machine, you can do it with this tool –format the partitions with FAT, unmount it, remove its line from fstab and hand it over to him so that he can format it the way he wants with Windows without having to resort to buying a partitioning tool if he hasn't got one.

With the partition looking the way that you want it, click on 'OK' and then specify any other partitions you want to create. With it all looking just right, click on 'Apply' and a green dialogue will appear asking you to confirm your intent. Click on 'Apply' and it will partition and format the drive for you. For a 160GB disk, as a single

partition and formatted with ReiserFS, this took just a couple of minutes.

It's now ready to use as one computer's drive space, but for those of you who want to continue with turning the new storage into NAS, open up a file manager, find your mount point, right-click on it and select 'Properties'. Click on the 'Permissions' tab and check the appropriate boxes and ownership details – for a universally accessible NAS, give everybody show, write and enter permissions and set the ownership to User: nobody and Group: nogroup. Remember that your firewall should be configured to block out all smb traffic in both directions otherwise people on the Internet will be able to access your storage and use its capacity or your data for their own purposes.

Finally, go into /etc/samba and open smb.conf. At the bottom, you need to add your NAS entry so that it's accessible through smb. See this month's SuperDisc for more details.

WORD

More Accessible Count

Q I find it more than a bit annoying that it takes so much

time to get to Word Count via the Tools menu in Microsoft WORD. It's a few places down on the menu, and when I need the count and click on Tools, my eyes automatically search for where it is. Looking at the resulting figures in the box is a necessary distraction, but all the rest is just too much. Is there a way to move the Word Count to a different, more accessible location?

T Hinton

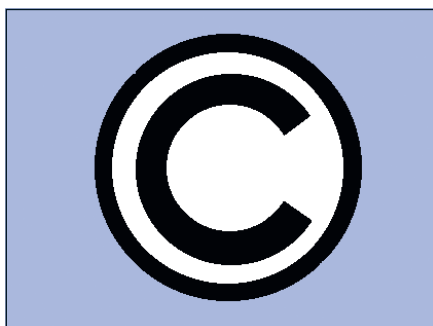
A WORD abounds in ways to make life easier for us all, but the way to invoke the relevant changes is seldom obvious. One thing you may want to do is to put WORD COUNT up in the menu bar along with File and Edit. If you place it on the right it will be readily available, one easy click away. Here are the steps:

- 1 Click on Tools and Customize
- 2 Click on the Command Tab
- 3 Select Tools in the Categories pane, on the left side of the box.
- 4 Select 'Word Count' in the Commands pane, on the right side of the box. You may have to search a bit for this entry.
- 5 Use the left mouse button to drag

COPYRIGHT LAW Fair use? License?

Using copyright in the correct way is good for business and good for creativity

Copyright law need not interfere with network-wide use of a program, as long as a program isn't used simultaneously too often.



Q: At my office we have a program that monitors our whole network resources. On some occasions I can't gain access to run a particular program, even when there's plenty of disk space, memory and so on, while most of the time I can sign on immediately. One of the systems administrator staff tells me that the problem is to do

with copyright license. To me, this doesn't make any sense at all. If it's sometimes legal for me to execute a particular program, when can it be illegal? Does a copyright license qualify you to run a program only at certain times?
J Cielli

A: As far as we know, there's no complication that makes the right to use a program dependent on the time of day. The supervisory routine that's sometimes stopping you no doubt is dealing with the number of licenses that your company owns.

Suppose your company purchased fifty licenses for using a particular suite of programs, yet there are a hundred possible terminals that could well make use of that suite. In such cases a supervisory program will ensure that only fifty people are using it at any one moment. Enforcing copyright by licensing is not about stopping you making extra copies of a program – it's more concerned with preventing you using more copies than you have the right to use.

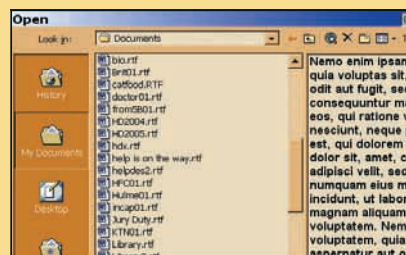
It warms the cockles of our hearts here to see a company respecting copyright in this way. ■

Microsoft Office

A different view in any Microsoft Office application

Did you know that you have a choice of several views when you use the Open dialog in one of the Microsoft Office applications? The default is a listing of file names in the current folder, but if you key ALT + 6 you get a detailed view: each file along with its description, length, dates and so on. ALT + 6 again will bring up a view with

document names in the left pane and properties of the currently selected file in the right pane. Pressing ALT + 6 once more will change the view in the right pane into a quick view of the content of the selected file. Note that when using 'All files' in the navigation options you can even view things like .BMP and .TIF files. ■



This is one of four different views of your files afforded by the Open dialog in any Microsoft Office application.

this entry, and drop it on the menu bar.

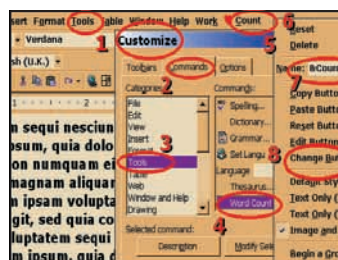
6 Leave the Customize box in place (don't close it) and right click on the new entry in the top line.

7 Go down to the Name entry on the right-click menu, and key the name you wish for it. Optionally you may precede the 'key' letter with an ampersand (which will not appear in the bar). For example if you name it '&Count' the combination ALT + C will call it to the screen.

8 At this point you may like to select an icon to appear alongside the name (Change Button Image and so on). A bright icon will make it more obvious and may shave a second from the time it takes to look for a particular entry in a toolbar.

9 Turn your attention back to the Customize box: you may choose where you want to record this change, and the Save In field gives you that opportunity. You may wish to have the word count in the command bar only for documents using, for example, your essay template (DOT file-type), but saving it in Normal.dot makes it universal.

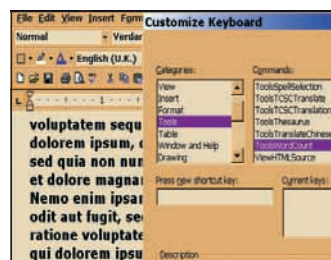
10 You may like to assign a special keystroke to invoke your entry



If you write material to specification you may want frequent access to the word count. It may make sense to elevate it as a main function, accessible with a single click rather than clicking Tools, finding Word Count, and then selecting it.

(as well as ALT + C in our own implementation) by clicking on the Keyboard button in the Customize box. This opens a new dialog. Select Tools in the Categories pane and ToolsWordCount in the Commands pane. You can find ToolsWordCount by clicking anywhere in the Commands pane, then V, then press the up arrow until you have landed on ToolsWordCount. Tab over to the 'Press New Shortcut Key' and select your desired combination. Notice that you can again select where you want to save this combination: again Normal.dot is the universal template. Finally, press Close.

11 When you've finished customising, press the Close button at the bottom of the Customize dialog box.



WANDERING TASKBAR

In Windows generally, the taskbar can be moved so that instead of sitting at the bottom of the screen, it can lie across the top or dangle down either side instead. Whilst some people might feel happier with it across the top, most people are not and being unable to find an auto-hidden taskbar can cause concern. In Windows XP, you can stop this from happening by right clicking on the taskbar, selecting the ever useful 'Properties' from the menu and then checking the 'Lock the taskbar' checkbox. Once you have done this, the taskbar will wander no more.

WINDOWS

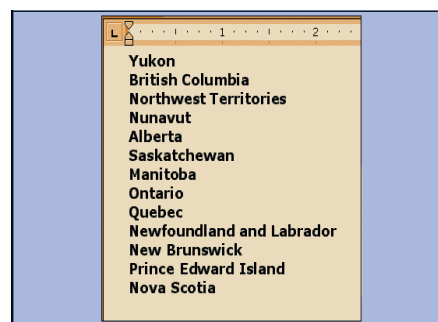
Uninstalling uninstalled programs

Q I've been unable to delete two particular programs from my system, and the Add/Remove applet in the Control Panel won't do the job. Trying to delete one of them even hangs my machine, forcing me to restart. The programs have gone (or at least mostly gone) and can't be executed, but there's clearly something still in the system that prevents me getting rid of them entirely. Is there a way to identify these still present components? Can you tell me how I get them off the system's list of installed programs?

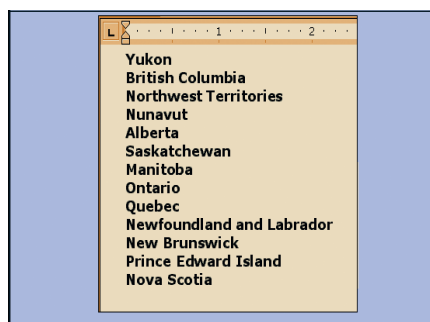
Don Carstairs



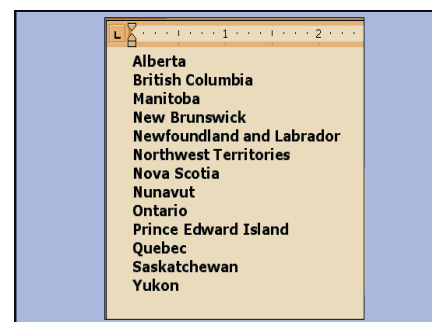
Sorting lists



1 So often you can get data in an unsorted sequence, but you recognise that it would be more useful if it were sorted. There are some resident routines that are available at a low cost that will sort a list for you, but you don't need this. If your list can be made on separate lines, or as the start of separate paragraphs, you have the necessary tools to hand.

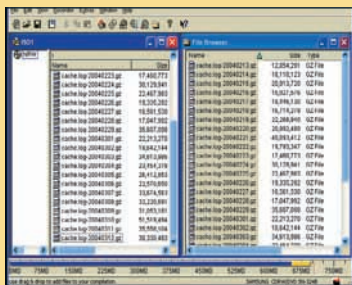


2 This list of the Canadian provinces and territories from West to East. We have made paragraph marks visible by enactivating Show All (CTRL + SHIFT + 8). Because there is a hard 'new line' code at the end of each entry you should realise that each line here is considered a new paragraph.



3 Sort the items instantly – even quite a long list (unlike this) into alphabetic sequence by selecting all relevant lines and then from the Table menu click on Sort. From here you need only make sure the first few fields are set to Paragraphs and Text (these are the usual default) and press ENTER or click on OK.

Archives Never throw them away



It might be tempting just to delete those old log files but think again

If your hard drive is filling up with log files, you might just decide to delete them – after all, they are only log files. However, remember that even though you have never needed to do anything with them in the past, the first time you will actually require them

is within a few hours of having deleted them – if you are lucky, it could be a few days.

So, before you eradicate them in order to make way for, well, more log files, save them onto a CD-R and put them in a CD wallet in a safe place. If the files are more important and you will probably need to refer to them at some

stage then make several copies. Remember to take a set somewhere off-site, somewhere that requires a different type of disaster to destroy them. Also, make sure that they are with somebody you can trust – there's little point in giving a backup to somebody who is going to use it as a coaster. ■

A What you're seeing in the Add/Remove Software list are the details in the Registry about how to delete the program. Windows assumes that when you install a program, you will also provide the name of a routine that will uninstall the program. The program description or name is kept in the Registry along with the name of the deleter. Sometimes there's an error in the deleter, or it's not properly configured to remove everything.

Perhaps all that's left of each of these programs is its entries in the Registry: in our experience this is usually the case. To rid yourself of these entries you will have to edit the Registry, so we urge you to be careful and make sure you can resurrect a working backup copy of your Registry if things go badly wrong – which is always possible.

When you're ready, go to the Run... function (FLAG + R if you like), key in REGEDIT and enter. In the left pane, navigate through HKEY_LOCAL_MACHINE and then subfolders Software (but not SOFTWARE, which is a different subfolder), Microsoft, Windows, CurrentVersion, then Uninstall. This final subfolder has entries which appear in the software list in the Control Panel add/remove applet. Each is a long name made up of letters and numbers like {924D8117-FCB5-4CCA-914E-2661B448EC96}, which doesn't seem to

make much sense. Click on each in turn to see its key fields listed in the right hand pane. Glance through them to find DisplayName, along with the name that appears in the add/remove applet. When you have found one of your troublesome programs that resists final deletion, use CTRL + click to highlight both the DisplayName and UninstallString keys.

There may in fact be other fragments of a program deleted this way, including leftover references in the Registry, but you will have successfully removed it from the official list of programs on your system.

HTML

Browser Windows

Q I have a website and am involved in the news group that is associated with it. All of my internal hotlinks open up in the same window but, as I like to keep people on my site whilst letting them visit other sites that I have linked to, I use the target='new' tag in the anchor tag.

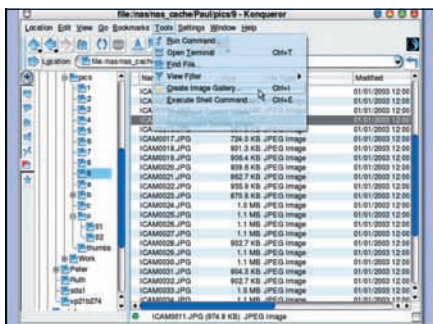
Linux users complain that this opens up a new Window and ask if I can instead make the link open up a new tab in the same browser. What is the name of the target to do this? Joshua Murby

A The target in the anchor tag tells the browser what to do with the link and is used in framesets to tell the browser within which part of which frameset to place a freshly opened page. By default, the browser will open a new page in the same window. If you are using frames and specify a window that does not exist, the browser will open up a new window – using 'new' will open up a window because the browser does not recognise the window name.

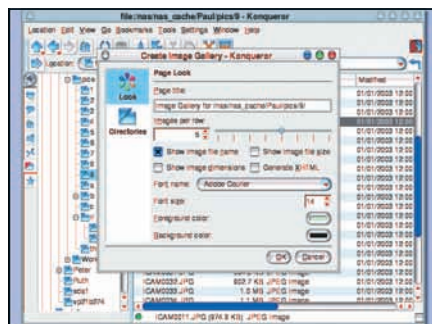
There are a number of target names that do have special functions if used within framesets: '_self', '_parent', '_top' and '_blank' should all be recognised by the browser and in the case of non-frame anchor tags, '_blank' opens up the new browser window with the other target names occupying the same window. Specifying whether a browser opens a new browser or just another browser tab isn't something that you can control at the server end, it's a browser problem.

In Windows' default browser, Internet Explorer, the user is stuck with having dozens of browsers open at the same time. However, even Linux's default KDE browser, Konqueror, has the ability to open new windows in tabs. For anybody that has not used a browser with tabs, this makes it all easier to

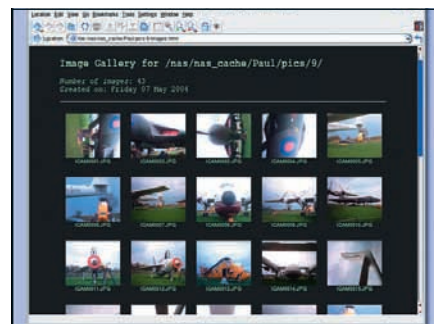
Linux Automatic photo galleries



1 If you store many images on your network shares, turning on 'Thumbnails' in your file browser, will download the whole of that subdirectory so that the browser can make its own thumbnails each time. If the images are large this can take time and get in other people's way. In Konqueror, click on 'Tools' | 'Create Image gallery...'.



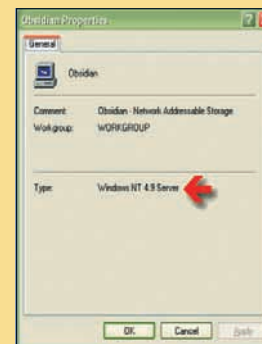
2 Next, configure the way that you want the page to look – being able to choose the page title, the number of images per row and various attributes including the image file name, size and dimensions. You can also specify the Font attributes as well. Next, click on 'OK' and the thumbnails and html file will be built for you.



3 Now, anybody with access to that network share can open up the gallery html file and see the thumbnails with minimal impact on the network. Clicking on a thumbnail image displays the full image in the browser which can then be dragged and dropped wherever the user wants it to go whether it is in a folder or an image editor.

TOP TIP

Don't believe everything Windows tells you – this 'Windows NT 4.9 Server' is actually a Linux server and is Microsoft-free. Windows just doesn't know so it guesses rather than admit it.



navigate through the pages you have opened and you don't have to click on a link to open up a tab – just right-click and select 'Open in new tab'. To get Konqueror to open up new pages in a tab instead of a new browser, your users need to click on 'Settings' | 'Configure Konqueror' and under 'Behaviour', make sure that the 'Open new links in a new tab instead of a new window' checkbox is checked. Next time they click on one of your external links, it will open up in a new tab instead.

DIGITAL CAMERAS

Delays in 'shutter speed'

Use the program on this month's SuperDisc to investigate your camera. Many Point Of Sale (POS) leaflets and advertisements claim the effective number of pixels for cameras – something we looked at in PC Plus issue 218. However, there are several other things that you need to know such as the effective shutter speed but perhaps more importantly, the delay between you pressing the shutter release and it starting to take the photograph.

The effective shutter speed depends largely (or usually) upon the amount



of light falling on the CCD sensor, but this is not always the case. The camera needs to be able to collect the intensity information from each cell so that it can work out the pixel values and it can only do this at a certain speed. Also, there's a delay that occurs between pressing the shutter release and the camera starting the scan. You need to know about both of these, otherwise you can end up blurring shots by moving the camera before it has finished taking the shot.

On this month's SuperDisc we have included a program (DCSS.EXE) which produces two progress bars – one at the top of the screen and one at the bottom – along with two digits. The program automatically calibrates itself

In addition to the number of effective pixels, there are some other things you should know.

using your computer's clock so that it takes one second for the bars to scan the full width of the screen. When you press a key,

it will count down from five and when it gets to zero, you press the shutter release on the camera. When the camera is ready, it will take the shot, recording the positions of the progress bars along with the digits. You should repeat this a few times to get an average.

You can see from the inset (top) that the camera used to test this has a delay in starting or around 0.9 seconds and a duration of roughly 0.2 seconds. Try to make the progress bars fit the corners of the image to get the best results. You can see from the shot (in bright sunlight) of the cyclist that the time taken to collect the image is significant even though this represents only 20 per cent of the image (bottom). **PCP**

Further Help

If you need an updated driver, or help direct from a manufacturer, first check its website. A search engine should be able to locate it – try www.google.com.

A list of internet addresses of many leading hardware and software manufacturers is published on the SuperDisc every month. See the HelpDesk page on the SuperDisc for details.

Newsgroups are also a great source of help and advice. Your question may already have been answered, so before posting a message search previous postings at http://groups.google.com/advanced_group_search. And don't forget PC Plus' own forums at www.pcplus.co.uk.



Related files on SuperDisc
See section: HelpDesk

DISKETTE Giving up the ghost

Transferring data from floppy to hard disk

Q: My son and I have been transferring old programs and files from 3.5in floppy disk to hard disk. The disks have deteriorated, and lots of them give errors when we try to copy them. Can you recommend a cheap utility that will help us save the contents?
Stephen Docherty

A: The glory days for the floppy disk may be well past but it was a trusted tool, and still stands ready for emergencies. You should equip yourself with an emergency startup disk. Your floppy disks are less likely to be at fault than your floppy drive, because diskettes are pretty resistant to bad

conditions. Give the drive a thorough cleansing: you can still obtain inexpensive cleansing kits. There are a few secrets to the process of copying data from a troublesome floppy:

1 If there's a bad spot on a diskette, it may well be in a place not even used for data. Instead of copying the whole disk to a new one, try going into MS-DOS. From there navigate to a clean folder ready to receive files, then enter the command "COPY A:.*" (without the quotes). This will copy only the data portions of the diskette.

2 Whether you are in MS-DOS or in Windows, be persistent when you get an error: keep choosing 'Retry'

relentlessly – even 20 to 30 times. In our experience you can usually get past most errors.

3 Did you know that SCANDISK works for diskettes? Apply it only after encountering problems, though.

Why give up on using floppy disks as an offline storage medium? Having your data and programs on them is much more useful than having them only on hard disk when your system develops a fault that makes mincemeat out of a disk partition. And remember that you can, literally with the movement of a fingertip, prevent the accidental deletion or corruption of a diskette – but not so your hard disk. ■



Maybe the floppy disk has no future, but is it right to let it forsake its purpose to safeguard your data?

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Simon Pickstock deals with a frozen keyboard, a host of queries, and a man whose PC problem is stopping him from ruling the world

FIRMWARE UPDATE

Laptop troubles

Q While working on my laptop, the keyboard froze and then the screen started to misbehave, with windows opening and closing. The mouse worked okay, so I was able to close down properly. When restarting, this message appeared: 'Ready for EC/KBC update. Place your EC/KBC diskette in the drive and press any key when ready to proceed.' The keyboard remains dead and the floppy drive keeps starting and stopping as if it's looking for a diskette. I can't start with the start-up disc as the same message appears and the disk is not recognised.

The laptop has not been connected to the Internet, and I haven't imported any files from my PC, which is protected by Norton AntiVirus. The only import has been a screensaver from a magazine freebie CD about three months ago. I checked this for a virus and it appears to be clean. The laptop is a Toshiba Tecra 8000 and it's loaded with Windows 98 and Microsoft Office 97.

C H Gardner

A EC/KBC stands for Embedded Controller/Keyboard Controller. In Toshiba computers, the Embedded Controller is a special firmware that provides interfaces for the CPU to communicate with the system chipset. The KBC is a special firmware that provides interfaces to enable the CPU to communicate with PS/2 keyboards and mice.

The error message described means only one of two possible things: either the [Tab] key on your computer is stuck, or your system needs to be serviced. First, turn the computer off. If the cause is a stuck [Tab] key, you may be able to unstick it just by tapping the [Tab] key several times. Next, turn the computer back on. If you don't see



If the keyboard freezes on a Toshiba laptop, it may need servicing by a Toshiba Authorised Service Provider.

'Ready for EC/KBC update', you have successfully fixed a stuck [Tab] key. If you do see the 'Ready for EC/KBC update' message, then you should contact a Toshiba Authorised Service Provider and have the system serviced.

BROADBAND

Budget connections

Q We're thinking of purchasing Tiscali broadband (512K), but we have one little problem. Our phone socket is nowhere near the PC. Is there any way of wirelessly connecting the two things together and keeping the price as low as possible? I've read that it's possible to use a wireless access point and a wireless PCI card, and I have priced those up to be approximately £60. What do you think?

R James

A To keep the price as low as possible, the simplest way is to add an extension phone socket that's near your PC. You can request that BT does this for you, but it will charge you over £100 for the privilege.

You can do it yourself for about £10: you just need an extension kit that you

can buy from any good electrical hardware store. Make sure that the kit is BT approved, as this will ensure that it's compatible with broadband signals.

PROCESSOR

Improving performance

Q I have a home-built PC with an ABIT KT7-RAID motherboard, fitted with an AMD 700MHz CPU and 512MB of memory, and I'd like to improve its performance. Will any of the latest series of AMD processor, such as the XP 2000+, run on this motherboard? I've been to the AMD and ABit websites without any satisfactory answers.

Eric Nicoll

A Upgrading older motherboards can seem like a voyage of discovery. Looking at the BIOS upgrade page for the KT7, the fastest Athlon supported is a 1.4GHz classic Athlon running on a 133MHz bus.

If you have a KT7A motherboard you have nothing to worry about, as it's officially Athlon XP-compatible. However, we've got plenty of reports that the earlier KT7 motherboards will also work without a problem, it's just


<http://forum.pcplus.co.uk>

Simon Pickstock
simon.pickstock@futurenet.co.uk

Simon's meteoric rise in publishing continues as he assumes the helm on PC Answers and PC Upgrade. In his spare time... oh, no, he doesn't have any spare time!

that the VIA KT133 chipset it uses doesn't fully support the 133MHz bus, despite its name.

Before you upgrade, make sure you download and install the latest BIOS from ABit for the best compatibility. The main problem you'll encounter is how the motherboard detects the new processor: you'll need to adjust the FSB in your system's BIOS to get the optimal performance. An Athlon XP 1800+ has a real rating of 1.5GHz, so it should provide a good step up in processor power for less than £30, and even on a 100MHz bus it will run at 1150MHz. After installing, you might notice that the POST screen doesn't display the correct processor description. This is normal, as the BIOS support hasn't been updated to officially recognise the new processors. It might sound a little hit and miss, but it will work!

GRAPHICS CARD

Trident Cyberblade

Q I'm the owner of a laptop that has the Trident Cyberblade i7 graphics card installed. However, I have a problem: this laptop came with Windows 98 installed and I have now upgraded to Windows XP and need an updated driver. I'm told by Trident that this card does support DirectX 9, but I have also been told by Trident that it's the end user who's responsible for supplying the driver. After checking with Gericom, they told me that this laptop is only supported by Windows 98/NT/2000. Is there any advice you can give me? **Woody**

A The Cyberblade i7 is an integrated video chip. It was included on laptops by various manufacturers. We have found an XP driver provided by the owner of an HP Pavilion laptop, and we would recommend that it's worth giving this a try. You can find it on the excellent Driver Guide site at <http://members.driverguide.com/driver/detail.php?driverid=55324&action=summary>. You may find that you'll need to register for free before being able to access the driver. You will also find a raft of other Trident Cyberblade drivers on this site, so if this one doesn't work, there will be others to try.

HARD DRIVE

Double my hard drive

Q I have an 80GB hard drive with Windows 98SE on it. Is it possible to split the drive in half and install XP on the new drive? I'm willing to format the PC if it needs to be split first and then install both Windows 98 and XP on it. Please can you also tell me some information about the BIOS changes that I might need to make?

Nick Arvanitakis

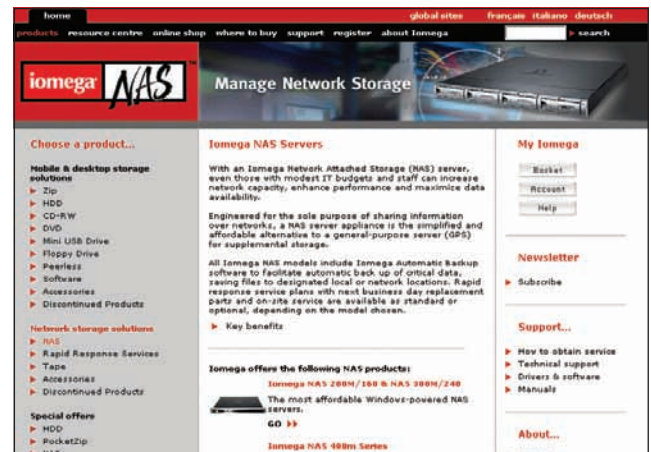
A Windows XP has made this apparent hard drive challenge very straightforward. All you need to do is go into the BIOS and set the Boot order to look to boot from your CD-ROM drive first. Once this is done, insert the Windows XP disc and reboot your PC. Enter the XP set-up and go to the Advanced options, where you'll find that it takes you through creating an extra partition for you to install XP on, that will sit alongside your existing Windows 98 installation.

IP ADDRESS

Nasty NAS

Q I've got an Iomega NAS P400M running alongside my RAID-based Pentium 4 3GHz system, along with two other lower-specified networked PCs. I'm running Windows XP Pro on all three PCs. The goal I'm working towards is to have this set-up running a web server and also managing my internal network, but I've got a rather basic problem with the network storage.

There is a utility that comes with the Iomega hardware called the Discovery Tool, and this is supposedly how you change the assignment of your IP address. However, I just can't get it to work. I follow all the instructions and make the change, but the change never actually gets applied. Am I being really dense, or is there something else that can be done to help? Not being able to get my client PCs recognising the NAS is stopping me proceeding with my ultimate plans for world domination... **Jamie Faulkner**



A The first thing to do is to check that you have the basic configuration set up correctly. Refer back to the manual, check all the cabling and switch connections, and ensure that you're using LAN port 1. If you have a DHCP server running, ensure that the NAS P400M is set to obtain an IP address automatically. The next step is to manually assign an IP address. At this stage you should check that the Discovery Tool is recognising the NAS on the correct network. If it's showing a different logical network, then you may need to change the address of the client machine to match the logical network address of the NAS. Now run the Discovery Tool on the client machine and double-click the NAS unit, which will launch IE and prompt you to log in.

Once you have done this, select Terminal Services from the Maintenance tab. Right-click the My Network Places icon and select Properties. Double-click the active LAN connection, right-click the TCP/IP protocol and choose Properties again. Manually assign a static IP address that matches the current subnet. Apply the changes and you will lose the connection to Terminal Services. Wait for a minute and use the Discovery Tool to try and find the NAS again.

If you double-check, you should now see that the IP address has changed in the Discovery Tool as desired. If you had to change the client IP configuration to perform these steps, then now is the time to revert them back to the original settings. **PCP**

With an Iomega NAS device, use the company's Discovery Tool utility to change the assignment of your IP address.

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Paul Grosse demonstrates tricks with images, menus and SSIs for making your web pages an entirely more accessible experience

WEB PAGES

Making it accessible

Websites are often constructed using feature-packed, WYSIWYG editors that employ the latest HTML tags to render your artistic efforts exactly as you specified – regardless of logic. The problems? Such pages will often only render properly in the screen size you specified when you created the page. Even worse, there are a myriad of browsers that won't display your page the way you intended. Users who are visually impaired will have images turned off, and will find graphically rendered text useless. It's time to look at what is really needed.

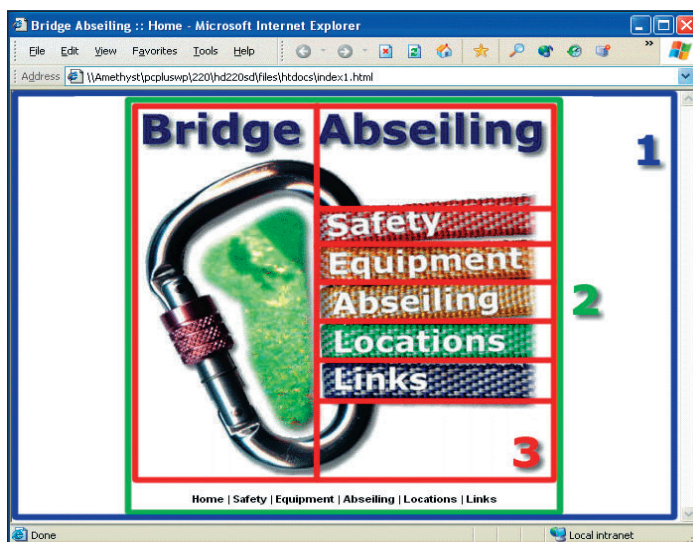
For well-designed private and small business pages, you will want a homepage that gives a brief overview of the site, and a consistent layout that is easy to navigate. Both should be viewable in any screen resolution; on any platform; on any browser; behind an application-level firewall that strips out all JavaScript; on a browser with graphics turned off; and on a text-only browser such as Links.

Clearly, if your site is about image processing, text-only browsing could be ignored and there are various reasons for ignoring some of the other criteria. However, you have to draw the line, and if you cut out too much of your audience, you will lose out on traffic.

Homepage rules

Let's say, for example, that we want to create a website for people who abseil off bridges (although the principles here apply to any site). For the homepage, we want a central graphic that gives the user an idea of what is on the site and implies the basic layout of it. This will help them find what they want quickly, giving them the chance to stay a bit longer and have a look around instead of moving on.

With our graphic designed, adding it to the homepage is quite easy, but there are several ways of turning one



Divide your homepage image up into slices and then put them into nested tables. This works on virtually any browser, and will always be central in the window.

image like this into the links we require.

1 A server-side image map has the browser send the co-ordinates of the mouse to the server when it clicks on the image. The image is placed within the anchor tags and carries a special flag – ismap – that tells the browser that it's an image map:

```
<a href="image1.map">
<src="some_image.jpg" ismap>
</a>
```

Image1.map is a program that takes the numbers passed to it and decides what should go back to the client. You should include border="0" and the width and height of the image. It's easy to set up, but there are disadvantages.

For a start, each click, whether it generates a new page or not, sends a request to the server which it then has to process. If users want to use that link again, they are unlikely to get the same co-ordinates, so extra processing, traffic and storage is required, which eliminates offline browsing. If users are navigating the page using the

keyboard, the browser doesn't know what to do because the server hasn't told it anything useful. Users of text-only browsers (or with images turned off) cannot use the links at all.

2 Instead, we use a client-side image map so that the browser knows what file to ask the server for. This time, an attribute – usemap – is placed within the img tag. This points the browser either at a file with the image map in it or at a map within the HTML file itself – the latter being supported in more browsers. In order to differentiate between image map files and an image map within the current HTML file, a hash mark is used for the latter:

```

```

The map information itself is best located immediately before the </body> tag and contains the location and shape of each active area, along with other information that you would normally find in an anchor such as href=, target=, title= and so on:

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HelpDesk welcomes questions, tips and follow-ups to published items,
but please note that we can only respond via the pages of the magazine.



Paul Grosse

paul.grosse@futurenet.co.uk

Paul started computing back in the days of coding sheets. He believes that there is more to computing than rocket science

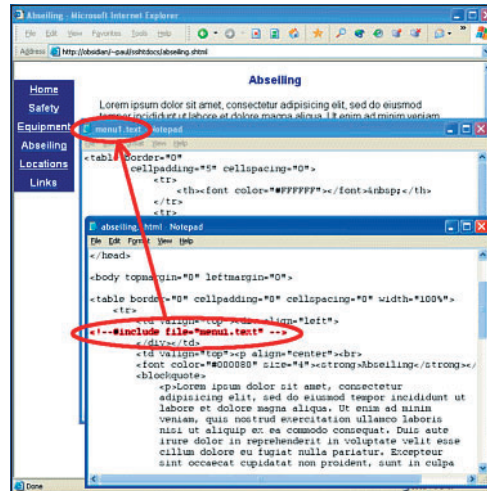


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```
<map name="somap">
<area shape="rect"
coords="10,23,56,85"
href="some_file.html">
...
<area shape="default" nohref>
</map>
```

The shapes aren't limited to rectangles (where the co-ordinates are the x and y of the top-left and bottom-right with 0,0 in the top-left), but include circles (shape="circle" with the co-ordinates of the centre and then the radius) and polygons (shape="poly" with the x and y co-ordinate pairs defining the outline of the shape). Find the co-ordinates for your image map by moving the mouse over it in an image processor, or changing the tag to ismap and noting the co-ordinates in the browser.

The area list is read in order, so if a point is covered by more than one area, the first occurrence in the list is processed. At the end of the list is the catch-all default, which can have no link if necessary using 'nohref' (as can any of the others). There are many advantages to this: you can navigate the link using the Tab key and will see the link outlines; the user gets the same page each time he or she clicks on any part of the link; and text-only browsers show a list of links when they press Enter on the '[USEMAP]' link. The disadvantage, is that users



with images turned off will not see the alt tags unless the mouse is there as well.

3 We can also split the image up into slices and paste them into tables, with each image having its own link in the same way that a normal image would. This is what has been done with the main image on the previous page.

The image was sliced up the middle and then into sections on the right. A 2x1 table was formed and the left image placed into it. A 1x7 table was inserted into the right-hand cell, and the other seven images placed

SSIs enable you to insert common code, such as menus, anywhere in an HTML document. Saving the file as .shtml lets the server know what to do with it.

SERVER SIDE INCLUDES

Frames enable you to change a menu by altering only one file, but all browsers don't use frames. However, you can still take advantage of this without excluding non-frame browsers by using Server Side Includes in .shtml files. Using special commands within the HTML code, the server includes any text file (which can be code fragments) in the HTML file it produces, sending it to the browser as though it was always like that. In that way, one menu file can supply all pages with the correct options. See the SuperDisc for more.

there with the middle five being given links in the usual manner.

In each case, the image was placed in the centre of the browser window and a set of text links placed at the bottom. The image was centred by having a whole-page, single-cell table with the table attributes width="100%" and height="100%" and cell attributes align="center" and valign="middle" (blue). For the split-image version, the images were placed as above in the red table, which was then placed in a single-cell table (green) with the text so that it appears together in the centre. Find out more on the SuperDisc. **PCP**

Text and images: fully adjustable tables

Ideally, your menus should fit all sizes of text and browser window – here's how

There are a number of ways of doing this. The most laborious way is to write a menu in a table and have that in every page. However, when you want to change it, you need to change every page again. To get around this, you can use frames.

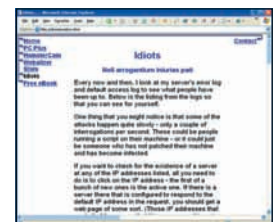
When using frames, you have a frameset. This file that is loaded up first by the browser, which then loads pages defined by it – these can include HTML files or more frames. Each frameset defines areas of the screen in simple terms, just by slicing them. If you want three frames, one on the left and a top and bottom on the right, you need to slice the page down the middle, and

then the right half needs dividing by another frameset. Each window is given a name in the frameset and hotlinks load into these using the target= attribute. In this way, you can have the menu down the left side, loaded from only one file. The disadvantage of this is that if users want large text, they are stuck with the graphics you chose or the text ends up too wide. In other words, they are not as dynamic and flexible as HTML is generally.

The other way, is to have your menu as a table (as in the most laborious way), but now taking advantage of the single, update menu feature of frames. To do this, create your page in the

normal way and when you are happy with it, save it as a .shtml file. Load this file into a text editor such as Notepad or KWrite, cut out the block of text that you are going to use as your menu and paste it into another text editor. Save your cut-out menu as menu1.text (or anything, as long as it makes sense to you) and then, in the .shtml file, where the menu used to be, add a line of SSI code such as <ww!--#include file="menu1.text" -->.

The server will be configured to look for .shtml files, and when it parses yours, it will see the #include SSI tag and substitute it in its entirety with the content of menu1.text. ■



A well-designed menu like this one will expand or contract to span pages of any width with text of any size.

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Your qualms this issue: the plight of home users, how children are hitting Print and sending us into bankruptcy, and more

Strictly business

I may chat fondly of disc packs, paper tapes and bead RAM, but I realise that computing is moving forward more quickly than I can cope with. Although I firmly believe that IT professionals should still understand elements of their trade, such as what RS232-C actually is, I still look to others, such as yourselves, for advice on the most up-to-date aspects of our business.

A few months ago, after reading your article on motherboards (issue 212), I elected to update my aging primary computer. This wasn't a single upgrade, as many components were due for replacement, namely motherboard and CPU, new RAM, new video card (it seems 1MB of Video RAM isn't enough anymore), a DVD-RW and a faster CD/DVD-ROM. I also decided to opt for a wireless keyboard and mouse set-up, and to switch from Windows 98SE to XP Professional.

Although physically the upgrade was fairly easy, just requiring planning and patience, the configuration and inter-operability took several months to de-bug, and there are still a number of 'features' I have to work around:

a) The Nvidia Personal Cinema card (based on the FX5200) is incompatible with the Logitech NX web cam. The TV tuner just does not work.

b) XP believes that I have two processors, although I can only count one on my 'Dual BIOS' Gigabyte board – maybe it's because the Pentium 4 is Hyper-Threading?

c) When a music CD-R is popped into the slot-loading Pioneer DVD drive, a system crash occurs. I thought Windows XP was stable!

d) None of the extended function keys on the Logitech wireless keyboard do what they claim to. Updates and keyboard settings make no difference. This problem has been reported to me from several other sources as well...

These anomalies suggest that manufacturers do not run sufficient tests prior to releasing their products. While we all know that software producers do not do exhaustive testing, hence the number of bugs in their products, it just seems bizarre to me. The usual response would be that they couldn't duplicate every possible configuration, yet there is a middle ground. On my system, I do have some unusual items – an LF-D101 DVD-RAM drive, an old Compaq DAT drive and an HP NetRAID SCSI RAID card – but none of these devices caused any issues. All the problems were caused by new kit.

Manufacturers are focusing purely on business, where the environment can be pretty much assumed to be Windows 2000 and Office on a Dell; that is where 80 per cent of their income is based. 20 per cent of us are pretty much ignored – after all, if I as a home user decide against buying a product, that's one lost sale; if I as an IT manager decide against standardising a product, that's potentially over 6,000 lost sales.

As an IT manager I am also a home user, and as a home user, I tend to be more experimental than a business manager, and I carry that experience back into business. The golden rule of customer support exists for a reason: 'Never assume anything about the person you're dealing with – they may be someone.'

Stuart Williams

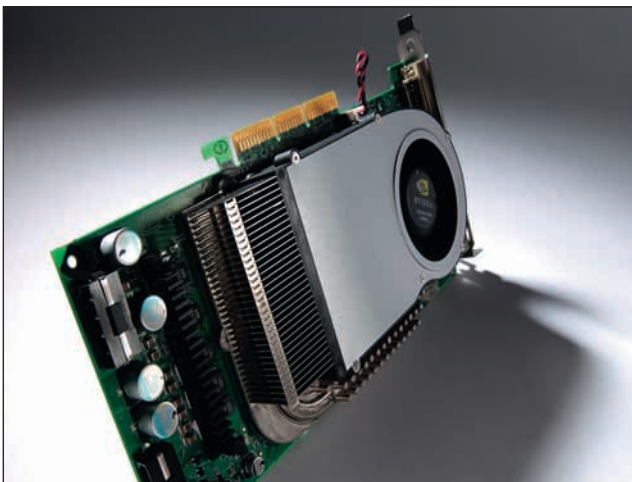
Editor, Ian Robson, replies: It's my belief that this one reader's experience is indicative of a large proportion of IT procurement managers the globe over. Manufacturers are beginning to understand that users' experiences are not simply limited to the office – can you imagine an IT procurement manager not having a vested interest in the subject area he/she has made as their career choice? That said, decisions about equipment used in the home as opposed to the office should stem from very different factors – whereas in the home you may have time to tinker, you certainly don't have the luxury and/or the inclination to passionately explore the driver settings required to get best performance out of a corporate graphics card. Quickly on point b), Stuart is correct in pointing the finger at Hyper-Threading as the reason for Windows XP displaying dual processors.

Search in vain

When I started using the Internet a few years ago, all seemed to be fine and sweet. Yahoo! or Alta Vista popped up in front of you, you put in a few keywords and a few seconds later, there was a choice of websites you could go to. They even offered something akin to what you were looking for in the first place, with the odd pornographic website thrown in for good measure. Difference was, you knew what you were getting when you visited the site.

For the umpteenth time this very morning, I've searched for something on the Internet, as I do most days in my job, only to be hit with a barrage of websites that at first appear to offer what I want, but when delved into further, are little more than portals making the website you wanted in the first place yet another five clicks away! Yes, I could have read down the list further, but that's just like asking me to read instruction manuals – impossible!

IT enthusiasts may enjoy tinkering with Nvidia's top graphics cards – business IT support probably won't.



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Ian Robson

ian.robson@futurenet.co.uk

Ian Robson is the editor of PC Plus. When computing first got on to his school curriculum back in the early 1980s, he was hooked

Okay, not work related, but I thought I'd seek out a new Java game for my phone. Being tight-fisted, I thought, hey, let's add the word 'FREE' to the front and see what happens. I got a whole shedload of possibilities and stared in wonderment at the Yahoo! screen in front of me, dreaming of the lovely new Java game I was about to download and Bluetooth over to my phone. Disappointment quickly ensued...

The first website I clicked on supposedly offered some free Java games and even had the names of them – as well as click-throughs where it would no doubt take me to the download site or automatically do it for me. As it happens, all it actually did was send me to another Java games portal; the first site listed here said 'no free Java games', where for my convenience, I could download whichever game took my fancy from any number of other websites for a small fee (I checked one, it was £4, so as it's a company phone I declined their kind offer).

This is just one example. I lose count of the amount of times I go onto the Internet and search for something legitimate for work, only to be directed to either a shopping website (Dealtime, Kelkoo, Amazon and so on), which I can understand as at least they're offering me a service, or, more frustratingly, faceless sites that just list more sites and more portals to find what I want. It's getting silly. I'm sure there are people out there who have decided it's a good idea to cash in on the affiliates' programs, and now just create pointless websites with lists of other websites on them and a thousand banner ads.

Here's a message to you guys if you're listening – we've already got these websites and don't want any more. We've had them since the dawn of the Internet and they're called search engines. I don't need a search engine to find another search site, thanks very much. Yahoo!, Alta Vista, Google, Lycos and Ask Jeeves all do a sterling job, so why foul it up? I'm sure if we removed half of these websites, the Internet would fly even without the need for broadband access! Ah, hit a nerve with the service providers I bet? That's it! All these sites are designed to slow down

PRIZE-WINNING STAR LETTER

Children's costs

The feature by Gary Marshall about printing costs (issue 218) covered the hardware side very well, but did not address an area that I find frustrating.

My kids use the computer for fun and research, but the Print button is a tempting target for the many attractive full pages aimed at children. Although Internet Explorer is set to ignore background images and colours, the illustrations usually spread acres of full-colour ink over several sheets of A4 paper.

Is it worth investigating if the writers of children's software and

websites are in the pay of HP, Epson et al? Oh, and while we're at it, maybe we should also ask if the makers of electronic games get a backhander from Duracell and EverReady.

Out of interest, the www.lpmcc.net site that I write has a 'media-printer' style sheet that prints black text on a white background with no background images. And as menus are meaningless on a paper copy, their display is turned off when printing. Why can't the pros do that?

Ben Crossley

Editor, Ian Robson, replies: The worst offender in this matter has to be Disney, who produces some of the most colourful greetings cards, stationery, and other tat that you could probably buy for a tenth of the cost of using your colour printer. But then the little ones wouldn't be learning how to be creative and/or frugal! Let me soften the blow when your kids get hold of the latest Disney film tie-in software with our Star Letter prize... a set of peripherals that are worth £140, courtesy of Creative Labs.

Win a fantastic set of Creative peripherals!

PC Plus has teamed up with Creative Labs to offer the writer of each month's Star Letter a fantastic set of peripherals worth £140. The winner will receive a Sound Blaster Audigy 2 NX USB 2.0 sound card. This unique device features 24-bit/96KHz playback, and support for

7.1 surround sound. The generosity doesn't stop there, however. Pen our most interesting letter, and you'll also receive a superb Creative Webcam NX, which boasts resolutions of up to 640x480, automatic exposure, and white balance control. So what are you waiting for? Get writing!



the surfing of mere mortals like me and railroad them into getting 3MB broadband from BlueYonder...

So, this is all I ask: no more portals, no more click-through websites. All I want is to search and find. Not much to ask really, is it?

Robin Bithrey, AP Keyboard Sales Support Engineer, Cherry UK

Editor, Ian Robson, replies: Ahhh! Wasting time on the web while looking for a freebie... True, the web has got quite large and unwieldy in recent times, but then that's the nature of the web. What's interesting is that the laws of natural selection that seem to pertain to all other walks of consumerism don't necessarily apply to the contents of the web. Even the most useless, unprofessional, unnecessary websites prevail, making your route to something decent less of a beaten

path and more of an overgrown forest. Next month's Search Engines Group Test should shed some light on what can capably beat that path, as well as provide some insight into what else you can uncover with a decent tool in hand.

Continuing serial

I have recently been trying to get my homemade system to boot Windows 98SE from an SATA drive, but it always hangs part of the way through. It boots into Safe Mode okay, suggesting an issue with drivers – but I can't find out which. I have tried all the obvious things like BIOS updates, SATA controller updates and the Help pages of Abit, Microsoft and so on, all to no avail. A brief trawl through Google suggested that a lot of people are having similar problems booting from all flavours of Windows, but there was nothing to point me towards a cure.



FROM THE FORUMS

Having your say

EUROPEAN PARLIAMENT ELECTIONS – WILL YOU VOTE?

CRIMMER:

As I understand it, the Council of Ministers is generally considered to be the most powerful body of the EU. It's there where countries can use their national veto for decisions where a veto exists, i.e. those which have not moved to 'qualified majority voting'. But the European Parliament does have power, and it is constantly exercising it. For example, it will very soon have a key vote on whether to reintroduce its earlier amendments to prevent software patents. If you don't vote, your opinion won't count. Politicians are motivated by being elected. If you don't vote, they're that much more likely to listen to business lobbying groups instead.

ADRIANJOHNSON:

Not sure what I think about Europe anyway, but I don't agree with UKIP, because if we trade with Europe we are still bound by the laws, but just don't get a say (whereas at the moment, we do). As for software patents – if I write software, why shouldn't I patent it, if it's a new idea?

RICHARD COBBETT

Think of it this way: how do you feel about not being able to write that program in the first place because somebody's patented double-clicking? Or the act of saving a file to a memory stick?

ADRIANJOHNSON

Surely someone won't be stupid enough to allow large corporations to patent things that already exist in a computing environment. Would they?

DANX

Definitely. You're a huge company developing software with hundreds of 60-hour-a-week minions feeding millions to your investors, along comes this little guy and his little company with his program that's better than yours and it starts selling; it gets noticed. What are you gonna do? Innovate? The software industry hasn't been innovative in 10 years. That's too taxing for the board to do, and they ain't gonna listen to no two-a-penny developer who thinks he's smarter than they are because it probably costs money they'd earmarked for their new babe magnet.

MASTER OF PUPPETS

At this very late stage of the day I'm not sure if there's anything we can do to stop this becoming law. What big business wants, big business gets.

CRIMMER

We don't have to put up with it. We have power – all it takes is a bit of organisation. Don't give up when you don't get what you want – be ready to fight the next battle. Defeatism in the electorate is what big business wants – then they become the only voice the politicians listen to. If enough people make it clear that things are unacceptable, the politicians have to listen to us, or cancel democracy and set up a dictatorship.



<http://forum.pcplus.co.uk>

Abit supplied a parallel-to-serial adaptor with the board; it does not affect the booting issue, but it does allow me to run my second hard drive through the SATA controller. A range of tests suggest that everything to do with Windows works under SATA except booting. However, when the SATA controller is enabled in the BIOS (whether there's anything connected to the SATA headers or not), Knoppix refuses to boot from CD-ROM. It gets as far as the screen with Tux in the top-left corner, and hangs.

Can I boot Windows 98SE from my flashy new SATA hard drive, or should I consign it to the skip?

Tony Hewitt

Editor, Ian Robson, replies: If you're suggesting consigning Windows 98SE to the skip and upgrading to a more modern OS, then I would say yes. From the experience of many office tech-heads, as well as garnering readers' feelings on the subject, it's just not worth the effort getting around the issue of SATA support under Windows 98 in any of its flavours. A bit of a cop-out, to be fair, but after installing Windows XP on a SATA system without a glitch and marvelling at the incredible performance boost over my old parallel hard disks, I don't plan on going back.

Re-writing history

With the price of re-writable discs little more than write-once media, why don't software houses releasing time-locked demo versions or evaluation betas burn them to re-writable discs? I received the Office 2003 Beta 2 kit last year which contained 15 CDs, all of which are now defunct because of date restrictions and the programs not being the finished article. These discs could have been used for something else had they been re-writable, but I have to find someone to recycle them or dispose of them as landfill waste.



For a modern Serial ATA hard disk, you might consider a modern operating system to get the best use out of it.

ISPs, to a certain extent, are also guilty of this, releasing new versions of connection software every couple of months. Gone are the days when AOL used to put its software on reusable floppy discs. In a time when most companies are striving to be more environmentally friendly, helping reduce the number of CDs being disposed of by supplying demos and the like on re-writable media would surely help improve customers' perceptions of the companies concerned.

Mike Simms

Editor, Ian Robson, replies: The cost of media could be a factor in this, obviously, but in fact the real reason is mostly down to the speed of production, which actually has more of a bearing on cost. A recent Kodak factory visit revealed that the speed of producing a written 'once-write' media disc can be less than a second, while the mass production of a written re-writable disc can be up to 10 times slower due to the more volatile nature of the substrate. As always, environmental issues take second place to cost issues. But as you suggest, the environmentally aware public may well think with their feet should one company step out of the mould, swallowing the extra costs involved and providing re-useable media – akin to a supermarket suggesting that you reuse its carrier bags.



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This series	Part One	Part Two	Part Three
Sound editing with Audacity Quality	Introduction to Audacity	Recording with Audacity	Digital effects

Introducing Audacity

PROJECT TIME


1 HR 30 MINS

SKILL LEVEL


3 BEGINNER

No experience of audio editing software required

YOU'LL NEED THIS



A sound card and some MP3/OGG/WAV files to edit

FILES ON SUPERDISC



Any files you need to complete this Masterclass are on this month's SuperDisc

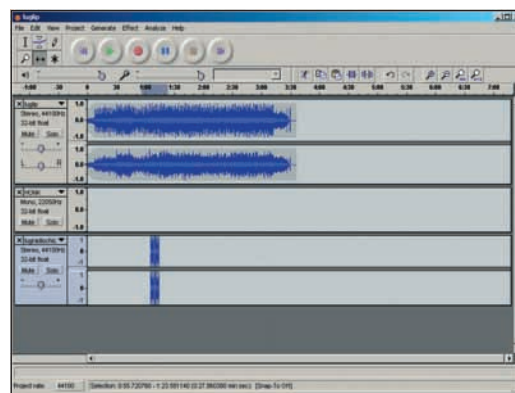
Become the master of your waveforms and manipulate your tracks with a superb free sound editor. **Jono Bacon** introduces Audacity

This month we're going to be kicking off a brand new three-part series exploring the world of sound editing. Although we could focus on software that would leave a numbness in your wallet, we will be covering a completely free and highly capable sound editor called Audacity. This application provides a simple, yet comprehensive method of creating some impressively edited content. We're going to begin looking at how to use Audacity for some simple tasks here, before moving on to discuss more elaborate techniques in the remaining two parts.

1 First impressions Not only is Audacity a completely free piece of software, it's cross-platform is available for Windows, Mac OS X and Linux. Details on installing Audacity and its associated tools are in the 'Installing Audacity' boxout.

With the software installed, you can run it by accessing it from the Start menu in Windows, or from the application menus in Linux (or Mac OS X). When Audacity launches you'll see that the main interface is fairly simple. In the main area of the screen we'll be editing our files and the buttons at the top, including the transport buttons for playing, forwarding and rewinding, and a palette of editing buttons. The buttons in the top-left area of the toolbar are the main controls that we'll be using in our editing. These include tools to cut waveforms, select regions, adjust volume, zoom into waveforms and other facilities.

The tools may look simple, but looks can be deceiving. Audacity gives you a few powerful tools with the ability to create impressive results, which may seem a little strange to those used to row after row of toolbar buttons.



Audacity can appear simplistic at first sight, but the true extent of its tools is impressive. You can cut and zoom into waveforms, select regions, adjust volume and much more.

2 Loading clips To get started, we're going to load up a new sound file and take a look at how Audacity represents the sound clip. Audacity supports a number of different file formats, so you can choose from MP3, OGG, WAV, AU and more. The web is littered with sound clips and music that you can download legally for free, and I suggest you download some clips that are at least a minute long – this will give you enough material to play with.

Once you have some clips, you can load them into Audacity from the File menu. With a clip loaded, you will see the waveform appear in the main body of the window. This waveform is the most critical part of the Audacity interface

Installing Audacity

Make the most of a sound-editing application with cross-platform capability



Audacity is very simple to install – just download, unpack and run. This means you can be up and editing in no time at all.

One of the main benefits of Audacity is that it's a cross-platform application. The program is built using the WXWindows toolkit, and has few dependencies when it comes to installation. If you are a Windows user, installation is as simple as downloading the installer and just following the instructions. Installation on Mac OS X is as quick and easy as downloading the disk image and dragging Audacity onto the desktop, while for Linux you just unpack the RPM or DEB on as normal.

All of this software is available on the main Audacity website at <http://audacity.sourceforge.net>. You can turbo-charge your Audacity set-up by adding some extra tools. Some of these will be covered in part three of this series, and may be of particular interest to musicians.

One such tool is the VST (Virtual Studio Technology) Enabler, available at <http://audacityteam.org/vst/>. This little utility will enable the powerful VST audio plug-in system to be supported in Audacity. This is very useful for adding special effects and adjustments to your sound. Another helpful addition is the LAME encoder for creating MP3 files;

you will need this to export from Audacity. LAME is also available from the Audacity homepage, as well as at <http://mitiok.free.fr/>.

However, despite Audacity's flexibility and aforementioned cross-platform nature, many of its individual plug-ins aren't so helpful. You should be aware that many of the VST effects plug-ins are not actually cross-platform, so be sure to check their compatibility before relying on them. A number of plug-ins are available on the Audacity website. In addition, Audacity supports LADSPA (<http://www.ladspa.org>) and Nyquist (<http://audacity.sourceforge.net/nyquist.php>) plug-ins. ■

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<http://forum.pcplus.co.uk>



Jono Bacon

jono.bacon@futurenet.co.uk

Jono Bacon is a freelance writer, consultant and developer specialising in free and open source software

and is an accurate visual representation of your clip. We will be using this waveform in more detail later when we begin to make small cuts. To the left of the waveform you will see Mute/Solo buttons, a Panning slider and a Gain slider. A little bit of playing with these controls will show you exactly what they do and how they function. These buttons will be useful when we record with Audacity.

3 Making selections The first tool we'll look at is for Selection. This is accessible from the toolbar and is akin to the carat in a word processor. When you click on this button, we can make simple selections by dragging the mouse over the selected area. Once an area is selected, move the mouse to either side of the selection. You'll see a hand pointer that will enable you to extend one side of the selection—this is useful for making more detailed selections. Even with these simple selections, we can still make cuts, and if you press the [Delete] key with a selection you can cut the selected audio out of the clip.

To make more detailed selections, you can use the Magnifying tool to zoom into specific parts of the waveform. The left mouse button will enable you to zoom in, and the right button will let you zoom out. With these two simple tools, we can already cut out chunks of audio that we may want removing or shortening. It's important to note that editing in Audacity is 'non-destructive', so changes to the clip will only be made when the file is finally saved.

4 Adjusting waveforms The next useful tool is Envelope. This button contains an icon with the image of a blue line between two small triangles. We can use this tool to make selections and adjust the shape of the waveform—this is particularly useful for increasing and reducing the volume of different areas of the waveform. To use the tool, simply click in an area inside the waveform and you'll see a number of white dots appear in a line. These dots can be

used to adjust the height of the waveform at that point. When you adjust another part of the waveform, the two points will be connected to make smooth changes in volume. Again, the closer you zoom into the wave, the more precision will be available to you for controlling your selections and adjustments.

Another benefit of using the Envelope tool is that by making lots of lines for adjustments, you can make small, subtle edits. This tool can be used for both noticeable and virtually unheard edits (an example of a useful subtle edit could be for removing a sudden outburst of bad language from a recording).

5 Multi-track editing One of the main benefits of Audacity is that it's a multi-track editor. When we loaded up our first clip we edited a single file. If you load another clip with Project/Insert Audio, another waveform will appear under the existing one. If you press the Play button, both clips will play at the same time, but you can make any minor adjustments required so that the two clips sound better together. A typical use for this kind of multi-track editing is for adding some background noise or music to a section. You can also use this technique for editing out pauses and stutters, or adding voice-overs to your clips (see 'Adding ambience' below for a tutorial on how to do this).

6 Experiment and export Using a combination of the tools we have covered so far, you can now go and experiment with your own ideas. A good suggestion is to listen carefully to the radio and note the ways that professionals mix music and vocal content together.

When you have created something that you are pleased with, you can then mix the finished work into a single file. Audacity supports exporting to MP3, WAV and OGG formats, and you can export either the full clip or a selection. These exporting tools are accessible from the File menu. **PCP**

GOING FURTHER

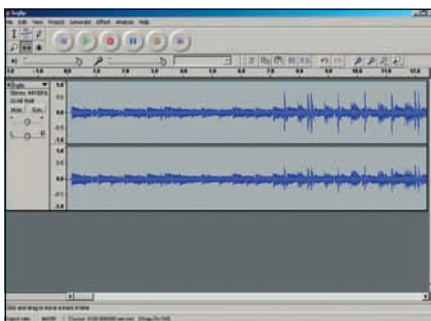
Audacity is very flexible and growing in capability all the time. As this capability increases, so does the complexity of using the tool. The creators of Audacity have plenty of tips on their website (<http://audacity.sourceforge.net>), ranging from FAQs to tutorials and more. Although there is always the challenge of learning the different features in Audacity, the real trick is learning the art of making great sounding edits. Learning this comes from listening to how other people have edited their sounds and what effect this has had on their edits.

NEXT MONTH

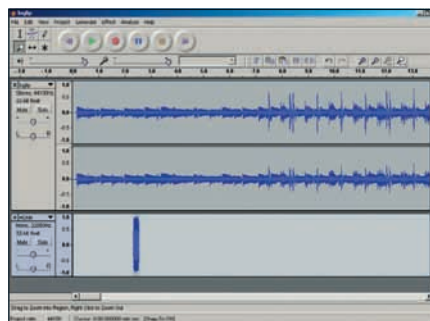
We will be moving on to using Audacity to record audio and edit our recordings.

Adding ambience

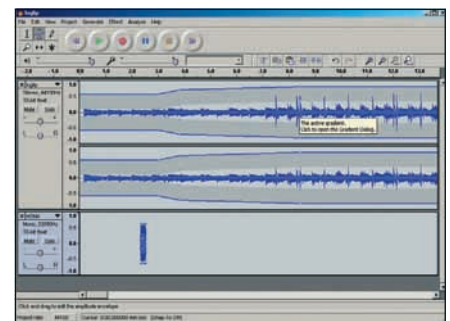
Audacity enables you to insert background effects to your vocal work with ease



1 You will first need to load the main vocal sound clip into Audacity. Use the File menu to load this clip, and then edit the clip where necessary (such as adjusting volume levels, removing unwanted sound and so on). Save the project.



2 Now, start loading in your effects clips. To do this, click on Project/Import Audio and the clip will appear below the main clip. You can use the Mute button on the main clip to hear just the effect, then edit it until you are happy with it.



3 Use the Gain slider on the Effects Clip bar to adjust the volume. Now use the Time Shift tool to move the clip to the right position under the main clip. Use the Envelope tool to adjust volume. Finally, go to the File menu to save and export the project.

This series	Part One	Part Two	Part Three
Retro game coding in Flash	The principles of web game coding	Getting Defender up and running	Wrapping up the details

Defending the Flash world

PROJECT TIME



2 HRS 00 MINS

SKILL LEVEL



5 INTERMEDIATE
Some Actionscript programming knowledge will be helpful

YOU'LL NEED THIS



Macromedia Flash MX or MX 2004. A 30-day trial is available from www.macromedia.com

FILES ON SUPERDISC



The full Defender game from this Masterclass is on this month's SuperDisc

Aliens and spaceships and soundwaves, oh my. Sham Bhangal continues his modern retro odyssey into Macromedia Flash

Having taken a good look at the basics of game design in Flash, it's time to start coding our own hit retro title. My favourite by far is the Williams classic, *Defender*. It has simple graphics, but its classic gameplay has kept it a firm favourite in annals of gaming – and it's a decent challenge to put together.

The action, if you haven't played it already, is standard 'B' movie material. There's a planet, a spaceship, some civilians and a lot of aliens. The aliens float in to kidnap the civilians; you fly around shooting the aliens from the sky and protecting the world. To bring all these pieces together, we'll need our graphics, the code to control the action, and a sound-engine to provide inspiration to the player courtesy of a pumping techno track.

Over the next two issues, we'll develop a game engine loosely based on the old-school real-time concept of interrupts rather than standard Flash events. The two are very closely linked – both essentially run from a trigger. The interrupt trigger was usually generated from an event (making it identical to Flash event-event handler pairs) but old-school programmers will tell you that interrupts could also run from one of a number of timers or clock pulses. Flash has one main clock pulse, the frame rate, but for efficient coding you really need to go back to the retro way of doing things and define separate clocks that trigger at the rates you want different things to happen. To do this, we'll use `setInterval` – an addition in Flash MX that programmers don't really seem to have taken to.

1 Back to basics Many designers try to update their graphics when remaking old games. That's often a good idea, but here we'll be sticking closely to the originals – simple icons and solid colours. In particular, we need to get our two types of ship onto the screen – the player's mighty vessel, and the ubiquitous evil aliens. To get an authentic, pixelated effect, we draw the basic sprites and set Flash to

default to 'Auto Low' graphics quality in the HTML tab of the Publish Settings window. You'll note that we've made full use of garish primary colours, but not touched gradients or alpha-blending at all. These colours have an authentic retro feel to them, and Flash will be able to display them quickly, making for a much more responsive game. As a finishing touch, all of our text uses a suitably retro font, *ArcadeClassic*, (www.1001freefonts.com/fonts/afonts7htm) a freeware font, from a designer going by the name of 'PizzaDude', whose site can be found at www.pizzadude.dk

Defender consists of several different elements – the score, radar blips, player cursor, aliens, plasma bullets fired by the player, scrolling terrain and the scrolling stars. There is, of course, one other thing you can't see – Flash has to know all about what's going on in the game, and the data you use to tell it defines your game world. Open up *FlashDefender fla* to see all the elements in position.

2 Time after time Before looking at these, take a quick peek at the timeline. We've created most of the game within an embedded movie clip called *mc.world*, which you'll find in the folder 'world'.

Each frame has its own specific task. Frame 1 initialises the game, but is otherwise blank. Frame 2 is the start of the game and contains Defender's 'guys'. Frames 9 and 10 are where the game ends, depending on whether you clear the level or die trying.

The movie clip 'world' is embedded on the main (`_root`) timeline, so let's take a look at it. Although it would be more 'Flash fashionable' to use a single timeline for all the code rather than having the embedded clip, it makes more sense to do it this way when streaming the game over the web. The main game needs to preload rather than stream, and the way to do this is to place it in a clip. At the same time, frames within `_root` will stream, so we never leave the player staring at a blank screen.

The three action frames are 1, 4 and 5. Frames 1 and 4 are identical, except that frame 1 initializes the game sound engine at the start of the game. This needs to occur only once, so Frame 1 is never seen again after putting in its appearance. The playhead will hold on frame 4 at the start of subsequent games. Frame 5 contains the movie clip with the game inside it and this frame is reached when the user clicks the 'Click Here To Go!' text.

3 Getting the game code The *mc.world* clip contains the guts of the game. On frame 1, we define the gameworld via two objects – *world* and *database*. The *world* object creates world constants and game limits (that is, properties that define the size of the playfield) and the *database* object is a more structured and dynamic set of data used to control the inhabitants of the world. This sets up our limits, constants and arrays. In particular, we have our limiters – properties like `LEFTSCREEN` and `TOP` marking the edges of the actual



You'll find hundreds of great Flash games on the web. Homestar Runner (www.homestarrunner.com) specialises in retro parodies. Trogdor the Burninator comes highly recommended.



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Sham is a beta tester for Macromedia and Discreet products and is the author of 'Foundation ActionScript for Macromedia Flash MX 2004'

screen, and BIGLEFT and BIGRIGHT doing the same for the much wider gameworld. This may seem longwinded, but it spares us having to think in pixels. It also enables us to change our limits if we change the game's screen size. Of course, the player will never see them – we declare them invisible just after creating them.

There are three other constants that aren't related to the game-world sizing: Inertia defines the effect of acceleration when the ship changes direction; Acceleration defines the speed of the game scrolling function; and maxSpeed and MAXALIENS set the maximum speeds of world and number of aliens respectively.

The database object holds our other elements in an array. These describe the player's ship and the aliens. ShipX and shipY hold the x and y positions while shipDead is a straight Boolean specifying whether the current graphic object is 'dead'.

4 Shooting at aliens Frame 2 contains the game logic. Although this listing is long, almost all of it is made up of simple if and if...else statements to perform the animation. The first part lists the 'controller' functions, which coordinate everything from the player's ship (shipController) to its plasma shots (fireController). These are fired off at regular intervals to drive all the graphics in the game, but not all of them fire at the same rate. They're assigned via a mixture of setIntervals and onEnterFrames.

The remaining functions are there to help run the game without directly controlling the main graphics – such as Alienspawn, which creates the aliens. The final section initializes the graphics, sets up various local variables and attaches movie clips and events.

Although the ship-control code looks long, it's only doing two very simple things. If dead, it loses its controlling events and plasma animation. If not, it moves to the same height as the cursor, moving to the left or right depending on which



Defender is one of the most famous retro games around and surprisingly complicated to get running. After getting your programming head around this, Space Invaders will hold no fear.

half of the screen the cursor is on, and flipping it so that it's always pointing in the right way. Consult the full code on this month's SuperDisc to see how it all works on the screen.

The alien code looks long and winding, but it's actually rather simple once you know what they do. First, they move – bouncing on the top and bottom edges of the game area, wrapping around to the other side when they hit the sides. The only other thing they do is check if the player has hit them. This detection method is far easier than you might think, thanks to the way we've organised the graphics. While you might think you're checking for a collision between the alien and bullet, we're actually just checking what would be hit and immediately marking it as such. Play the game and you'll be able to see this for yourself – the aliens often flashing before the laser hits them. We get away with this thanks to our fast moving beams and chunky aliens – all filling up their side bounding boxes. **PCP**

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Looking for more exciting Flash games programming tutorials? Flash MX 2004 Games Most Wanted, written by a whole team of multimedia experts, covers the whole spectrum, from cartoon platform titles to developing physics engines, Dance Dance Revolution contenders for the web and car racing. Full information can be found on the main site, www.friendsofdef.com, including a live demo of the dance chapter.

NEXT MONTH

Now that our space invaders know how to invade, it's time to wrap up Defender with the final key parts of the engine.

Getting the sound right

A pumping techno beat for our old-school classic

Not only do we have an efficient retro-style event to play with in terms of animation, we have something that isn't tied to the frame rate when it comes to sound: onSoundComplete. The problem with Flash 5 (and previous Flash versions) is that you could only start a new sound on the start of a new frame (the frame-based system clock rears its ugly head again). Unfortunately, the human ear is more sensitive to breaks in sound than to visual glitches, so it's historically been very difficult to sequence sound in Flash. The onSoundComplete event fires at around ten-times the game-rate, enabling you to splice sounds together much more

accurately. Have a look at soundEngine fla. This shows the music code used in the full game.

All it consists of are four sounds that are attached to the sound object soundtrack_snd depending on which key is pressed (1-4). The soundtrack function does the switching (running every time the current sound loop has been completed) and captureKeys takes input from the four keys, setting up the next loop to play. Note that we don't need four separate sound objects. Reattaching a sound is a very fast process, saving you from having to set up four events for each object.

Timing proves trickier. As any DJ will

tell you, you can only mix beats properly in musical time – in other words, we must wait for the current sample to complete before changing over to a new sound loop. The music sometimes changes well after you first tell it to, but this is part of the engine's advantage – keeping musical time and creating an interactive composition rather than simply changing sounds with no regard to rhythm.

As for the files themselves – always import them in full CD quality. This gives us the best quality sound, and we'll be able to export them out in smaller MP3 format as and when we're ready to roll out the final game. ■



Looking for new sounds for your movies? Flashkit.com offers plenty of choice, whatever genre you happen to need.

This series	Part One	Part Two	Part Three
Installing and using the GIMP 2 for Windows	Installation and interface	Tools and features for the photographers	Getting creative with the designer's toolkit

Capturing the GIMP

PROJECT TIME



1 HR 00 MINS

SKILL LEVEL



5 INTERMEDIATE
A basic understanding of adjusting photographic imagery will be useful.

YOU'LL NEED THIS



The GIMP can be found on the cover CD this month

FILES ON SUPERDISC



Any files you need to complete this Masterclass are on this month's SuperDisc

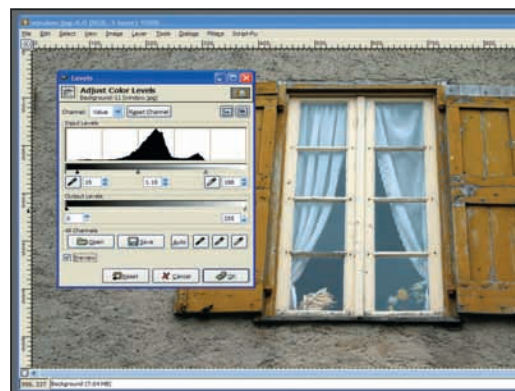
The GIMP can help you whip your photography into shape. **Chris Schmidt** explains how to bring out the details in your images

The previous tutorial in this series looked at issues relevant to the installation of the freeware image-editing software, the GIMP 2, so if you've just joined us you may want to check out our back issues. We explored the basics of the interface and how the new tools and palettes are arranged, but this month we'll be putting the theory into practice by checking out the options the GIMP provides for photographers.

Regardless of how an individual editing package works, you'll tend to find most of the tools and features necessary to correct and work with photographic imagery grouped together under an adjustments menu. For example, Photoshop contains such tools under the Image/Adjustments menu while Paint Shop Pro has a dedicated Adjust menu available directly from the toolbar.

The GIMP collects such related options under the Tools menu. Although many of these options are available directly from the toolbar itself, there are a number of specific options for photographers available under the Colour and Paint submenus that offer greater control over the correction of such imagery. However, to best appreciate the way such tools work we need to put things into practice, so open up our example problem image, window.jpg from the CD and let's see how well the GIMP performs.

1 Getting around curves The immediate problem with this particular image is the exposure. The overall picture is looking a little grey, as the subject failed to meter correctly. Such a common error can be easily rectified. A novice user may head toward the Brightness/Contrast options found



Many of the options available to the GIMP's tools can be compared directly to those available within more widely used applications such as Photoshop or Paint Shop Pro.

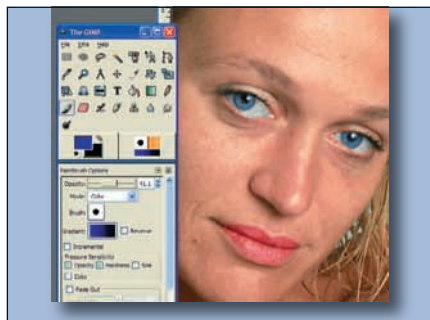
under the Tools/Colour Tools menu, although this will result in affecting the entire tonal range and risk clipping the colour data as extreme colour content is amplified.

A technique employed by more experienced users is to turn to the levels or curves of an image, which allows more specific control over the light balance of an image. The GIMP provides access to both methods through the Colour Tools submenu, using dedicated dialogue settings that enable you to best control the final effect. Both approaches should be familiar to anyone with any prior artistic experience. For example, with the Levels option selected a histogram of the image's colour range is visible and it becomes possible to

Retouching portraits



1 Open the portrait.jpg file from the CD for a typical portrait shot that needs a little retouching to bring out the best of the subject. We could make overall adjustments using the Levels controls although, in this case, duplicating the layer, changing the blending mode to screen and reducing its opacity enhances the studio lit appearance.



2 Brightening the whites of eyes and teeth is a common retouching technique, as is enhancing the colour of the lips and eyes. To intensify such areas load the brush with the appropriate colour and change the tools blending mode to Colour. You can now paint over such areas to enhance the colour while retaining original detail across the image.



3 In the absence of an equivalent of Photoshop's healing tools, the best way to remove blemishes from the skin is to make use of the Clone and Airbrush tools – sample the original point by holding down the Control key. Once complete you may choose to soften the overall skin using the Filters/Enhance/Despeckle option from the menus.

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Chris Schmidt is a freelance web and graphic designer as well as a regular contributor and reviewer for various magazines

drag sliders that determine the extreme and midpoints of an image. And, as with more popular image editing titles, you can determine individual colour channel output levels, automate the entire process or make use of droppers to determine the key points.

For more localised control over exposure problems it's also possible to turn towards digital versions of more traditional darkroom methods, such as the Blur/Sharpen, Smudge and Dodge/Burn tools. All of these can be accessed through the Tools/Paint Tools submenu or more directly, via the primary toolbar, where contextual options become available, therefore offering greater control over effects.

Such adjustments should be enough to rectify most exposure problems, although should your colours need a boost, you can always turn to the Hue and Saturation option, where raising the Saturation slider or the Colour Balance option may suffice. Both are found under the Tools/Colour Tools submenu and bear many similarities to their equivalents in Photoshop and Paint Shop Pro.

2 Transforming perspective All the usual cropping and resizing tools are available either directly from the toolbar or grouped together through the Tools/Transform Tools submenu. The Perspective Correction options are particularly worth exploring. This particular tool offers a more intuitive approach to even Photoshop's equivalent, operating in a similar manner to the new feature found within Paint Shop Pro 8. Once selected, a number of basic choices must be made primarily to determine the method used before a grid is laid over your image.

With the Corrective option selected, you can drag the anchor points as you attempt to match the perspective of the grid with that of the original image. Once this has been achieved, a click of the Transform button will automatically correct the perspective of your image. Our

sample file offers a good opportunity to try out the feature. Select the tool and choose the Backward (Corrective) method from the Perspective Options found below the toolbar. Then, click directly on the image to prompt the overlaid grid and drag the top corner points inward until you've matched the original. When you're happy with the setting, click the Transform button and the GIMP will make the necessary adjustments to straighten the image making it appear as though the window was shot face on. Such a feature will be particularly invaluable when correcting converging perspectives so often experienced with architectural photography.

3 Perfecting portraits Another key aspect of working with photographic content is the restoration and retouching of portraits. Unfortunately, the GIMP, as of yet, has no support for adjustment layers (see The limited GIMP below), which means many of the more common adjustments required to rectify such problems must be worked around.

In practice, those more familiar with using adjustment layers must regress to earlier methods, such as using the Clone and Airbrush tools for cleaning up skin blemishes for instance. Similarly, brightening areas such as eyes and teeth are best achieved by painting directly onto the pixel data with white, using the Colour Blending mode to retain original subtle detail. With a little imagination and creativity, many of the more essential retouching or restoration tasks can be carried out through careful use of blending modes and duplicated content through layers, as you can see from the steps on the previous page.

Despite such limitations it's not hard to see GIMP's power. It's more than a cheap alternative to more established titles. It has comprehensive tools and access to more advanced features through levels, curves, channels and blending modes. **PCP**

GOING FURTHER

Many of the techniques and methods you may have acquired using alternative image editing applications will use the same principles as the GIMP. The links page of the GIMP site (www.gimp.org/links) will provide some further advice, although some more dedicated and practical advice for the software is available from <http://empyrean.lib.ndsu.nodak.edu/~nem/gimp/tuts>. Despite appearances, the content behind the site will help you understand the potential of the software as it benefits from the experience of many of the key GIMP community users.

NEXT MONTH

We complete this series by checking out how creative we can get with the GIMP by using it as a graphic design tool.

The limited GIMP

For a freebie, the GIMP is impressive, but knowing its limitations will help you realise its potential

Overall, the available adjustment options found within the GIMP are comprehensive and make the software a realistic option for consideration as your primary image editing application, especially for when on a tight budget. However, when compared with professional image editing titles, there are naturally a number of limitations.

There are no healing tools, which have become the saving grace of the portrait retoucher (although this can be skirted around using the clone tool to varying degrees of success, employing similar techniques as were necessary when using Photoshop prior to their inclusion). Similarly, some of

Photoshop's more recent and advanced features such as the Shadow/Highlight, Channel Mixer and Colour Matching will need a little creative thinking to get around, although more and more of such features are finding their way into the title with each subsequent release.

A key omission, however, when compared even with Paint Shop Pro, is the lack of support for adjustment layers. These have become an essential method of controlling such common photographic adjustments without altering or affecting the original pixel content of the base image.

Without adjustment layer support the photographic retoucher or restorer must

be certain of what they are hoping to achieve with their adjustments as subsequent revisions will only further deteriorate the quality of the original layer. Whether such an important aspect of editing photographic content is to appear in a forthcoming upgrade only time will tell, so working on duplicate layers and backing up continued work must remain constant practice.

However, despite such shortfalls when compared with leading image editing titles it cannot be denied that the GIMP is by far the most effective tool in its price range, benefiting from a huge open source community constantly tweaking and adding new features. ■



Adjustment layers have become an essential in applications such as Photoshop although the GIMP is yet to support it.

This series	Part One	Part Two	Part Three	Part Four
Securing your Linux system against disaster, and recovering if and when it strikes	Basic back-up discussions	Backing up to CD/DVD	Creating emergency boot discs	If disaster strikes...

Making back-ups to media

PROJECT TIME



0 HRS 30 MINS

SKILL LEVEL



3 BEGINNER
No particular skills required.

YOU'LL NEED THIS



A working Linux distribution, CD or DVD writer

FILES ON SUPERDISC



You will find the full version of Mandrake Move on this month's SuperDisc

Paul Hudson demonstrates how backing up files on your Linux system to CD, DVD and other optical media can be a doddle...

Last issue we looked at the basics of how back-ups work on Linux – why they are necessary and what kind of software and hardware you need. Now it's time to get onto actually performing back-ups to various media and also look at how to time back-ups using the Cron daemon.

Like most operations in Linux, backups can be done in one of two ways: if you have a user-friendly distro such as Mandrake, SUSE, or Fedora, you can back-up your system using their special graphical tools for doing so. The alternative for other distros is either using the selection of shell tools at your disposal (usually tar, followed by bzip2, followed by cdc record) or by using one of the freely downloadable tools that do the hard work for you. For this tutorial, we'll assume that you fall into the first category, but backing up by hand is covered in the boxout, 'DIY back-up'.

All the text here is applicable to Mandrake 10.0, but both SUSE and Fedora come with similar tools and you should be able to transfer the knowledge to either of them. Having said that, Mandrake's tools are the easiest I've seen, and are also included on this month's SuperDisc if you want to try them.

1 Simple configuration To get started with the Mandrake backup tool (DrakBackup), you need to launch the Mandrake Control Center (usually under System/Configuration/Configure your computer, in the programs menu), select the 'System' menu, then 'Backups'. All of DrakBackup's features are controlled from here: configuration, setting execution time, performing back-ups by hand, and also restoring from back-ups.

The best way to get started is with the Wizard Configuration tool, as it gives you a step-by-step approach to back-up configuration. The first step is to choose whether you want to back-up the system files (everything except /home) or user information (the /home directory), or both. DrakBackup runs as root, which means it can read all the files you select here, even if they aren't owned by you.

Step two is where you configure the back-up location, which is where DrakBackup starts to shine: not only can you back-up to CD, DVD, or other optical media, but across the network using FTP, SSH, or other popular protocols. If you have more than one hard drive in your computer, it's best to back-up to the second hard disk as it's much faster and usually has much more space.

Once you've finished the configuration, click 'Backup Now' from the main menu, then 'Backup Now from configuration file'. Running a full back-up might take several hours depending on how many files you selected and the back-up media being used to store everything.

2 Advanced configuration Surprisingly, using DrakBackup in advanced configuration mode is little harder than the simple configuration, with the main difference being the availability of more options. This time the configuration is broken down into 'What', 'Where' and 'When' with the 'Where' section being almost exactly the same as the second step in the simple configuration. 'What' is mostly the same as the first step in the simple configuration, except that there's a helpful 'Other' button available that allows you to select precisely which directories you want to back-up. As your data is rarely as simple as 'back-up everything every

DIY back-up

You don't need to use fancy graphical programs for simple back-ups...



Who would have thought that the main page for tar could be quite as confusing as this?

Using just tar and bzip2 you can back-up most of your data quickly and easily. Both tar and bzip2 have very extensive manual pages, and tend to have new users running for the hills - never fear though, here's how they work.

First, pick a directory you'd like to back-up. It can have subdirectories in there if you want, and as many files as you want to test out. The command to execute is:

```
tar cvf backup.tar *
```

Those three letters (cvf) respectively stand for the following: 'create a new file', 'be verbose' – that is, print out the

names of the files and directories as they are being added – and 'use the following filename for the archive'. Backup.tar is specified as the filename to use, and '*' is used for the files to back-up – that is, tar will back-up everything in the directory.

The tar program is used to merge all the files and directories into one file, but it doesn't actually perform any compression. If you type 'ls -sh' you'll see that the file size is simply the sum total of the individual file sizes for each file in the archive. This works neatly in tandem with both gzip and bzip2, which compress only one file in each archive, which is why most compressed groups

of files are called either foo.tar.gz, which stands for gzipped tar file or foo.tar.bz2, which means bzip2ed tar file. Once we have the tar file with our back up in, simply execute the following command to compress it:

```
bzip2 backup.tar
```

That will give you, 'backup.tar.bz2' which should now be a significantly smaller file than the original! With the final archive ready to be moved somewhere safe, you can simply use a tool like k3b (or cdc record, for those less graphically inclined among you) to burn it onto a CD or DVD. ■



Paul Hudson

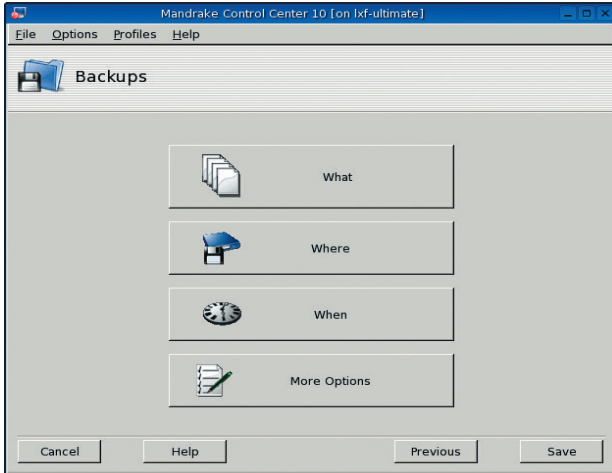
paul.hudson@futurenet.co.uk

Filling in for Frank during the holiday season, replacement guru Paul spends his days in the pen guin-loving land of Linux Format

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DrakBackup is Mandrake's back-up and restore solution, and, with a little prodding, can be made to do pretty much everything you need.

can restore all the files in a back-up using the 'Restore Selected Catalog Entry' option, or you can click the small arrow next to the date of the back-up to see individual files, select the ones you want, then click 'Restore Selected Files'. Either way, there's a very helpful option nested just to the right of those buttons: 'Restore to Path'. This allows you to change where the root directory files will get restored – that is, it still retains all the path information used in the back-up, but precedes it all with the path name specified here.

For example, '/home/paul/foo.txt' with the restore path set to '/backup' will restore to '/backup/home/paul/foo.txt'. This is the best way to do a quick restore so you can compare files by hand or using tools such as diff or grep.

The other particularly useful option is to search for files in a back-up, which is the first option in the Restore menu. When you search, the results are shown grouped by the back-up and you can select as many files as you want to restore at a time.

night', you will almost certainly want to make use of this useful option.

Then 'When' options are also new, which is where Cron jobs come in. Cron (and its alternative, Anacron) enable you to execute actions at specific times, in the same way that the 'at' command and its Task Scheduler GUI works in Windows XP. Tick the box 'Use daemon' to have the back-up performed regularly – you can select how regularly you want it using the dropdown box just beneath. There is a custom time option, but that is definitely advanced and best left alone.

3 Restore Restoring is actually the hardest part of using DrakBackup, so I recommend you try a full back-up/restore just to make sure you've got it all working properly. Of the four restoration options, you'll usually want 'Restore from Catalog', which is where you can choose a back-up to restore by the date it was performed. Using this option, you

4 Do it regularly! Now you know how to back-up, you need to do it frequently so that they back-ups are actually worth something. Although it's true that I'd rather have a month-old back-up than no back-up, I'd much rather have a week-old back-up. As DrakBackup can take all the hard work away from you by scheduling incremental system back-ups every night if needed, there really is no excuse for being without a back-up if your system goes down! **PCP**

GOING FURTHER

Storix

www.storix.com

Storix also produces more advanced back-up solutions that, for a small fee, offer more functionality and come with technical support.

Backup Howto

www.tldp.org

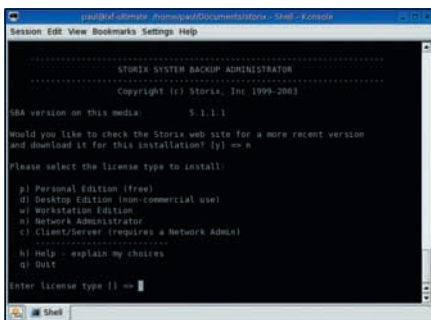
One of the many Linux Documentation Project how-tos covers back-up and restore quite comprehensively, including distro-specific notes for Fedora and Knoppix.

NEXT MONTH

We'll be looking at how to create emergency boot disks that can help bring your system back to life if the worst should happen.

Storix back-up tool

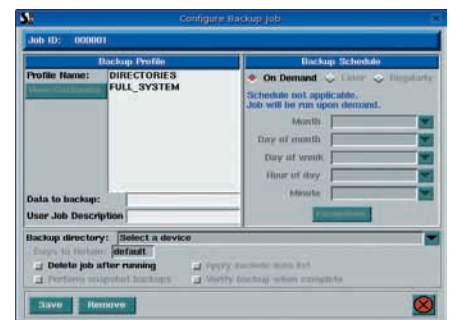
Another free app for backing up, available for most Linux distros



1 Storix makes an excellent and free back-up tool available that works on most Linux distros, called Storix Backup Administrator (download from www.storix.com). Installation is done through a simple shell script – just follow the prompts to get it installed.



2 The GUI for Storix isn't very attractive, but the three-pane view lets you see everything that's going on right now: what's queued, what's available, and what's running. As you configure new back-up scenarios, they will appear in here.



3 Configuring a back-up is as simple as following the simple instructions: select what you want to back-up, how often you want it to run (or whether you want it to be run by hand), and where you'd like the files to be placed.

This series	Part One	Part Two	Part Three	Part Four
Network and Infrastructure Monitoring	Bandwidth and system utilisation	Nagios and network monitoring	IP packet monitoring	Snort and deep-packet analysis

IP packet monitoring

PROJECT TIME



1 HRS 30 MINS

SKILL LEVEL



8 INTERMEDIATE
Some system administration experience will be helpful

YOU'LL NEED THIS



An Ethernet based network

David Coulson explores a variety of different software tools for monitoring and filtering IP packets and effective implementation

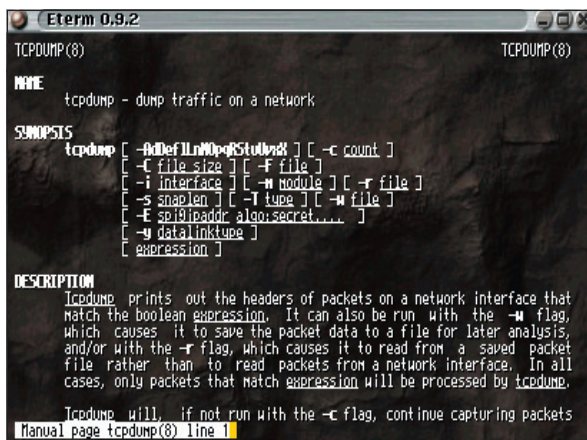
Whether you're managing a network or dealing with client/server processes, being able to track individual packets on a network means that you can quickly diagnose routing or firewall issues. Of course, on a busy network, being able to pick out the specific packets we're looking for requires software capable of monitoring and filtering packets without disrupting the network.

We're going to take a look at a variety of tools to monitor packets and the appropriate implementation needs for monitoring traffic on a very large network.

1 Traffic watch Traffic monitoring on a network usually involves watching traffic at either end point, or via a router or switch in between the two hosts, which are communicating with each other. We're going to start out by assuming that the two end points are Linux systems, and that there's only a single switch in between the two systems. This makes life easy, as there's no IP routing in place, nor any complex Layer 2 activity, such as Spanning Tree, which may throw Ethernet frames around on the network.

The most well known tool for traffic monitoring is 'tcpdump', which, coincidentally, also happens to be the most complex to use. Being a command line tool, we can use it to carefully craft a filter command to only show the specific traffic we're interested in.

tcpdump is the de facto network analysis tool for Linux systems, providing details of every single packet passing through a specified interface. (www.tcpdump.org)



Running 'tcpdump' against a single Ethernet interface will likely produce a crazy amount of output looking something similar to the following:

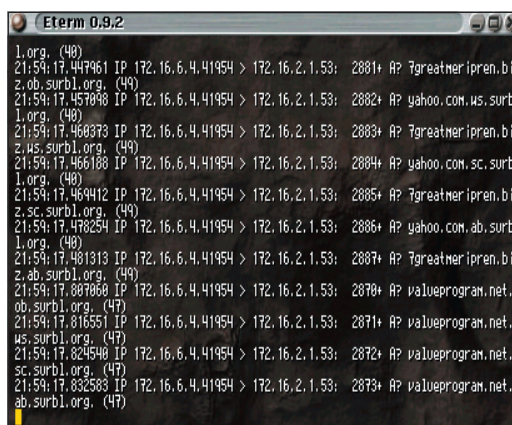
```

# tcpdump -i eth0
tcpdump: verbose output suppressed, use -v or -
vv for full protocol decode
listening on eth1, link-type EN10MB (Ethernet),
capture size 96 bytes
20:37:33.899601 IP 10.2.3.1.domain >
  
```

```

10.2.3.3.33056: 62555 NXDomain 0/1/0 (118)
20:37:33.956757 IP 172.16.6.4.mysql >
10.2.3.3.56712: P 1:44(43) ack 91 win 5792
<nop,nop,timestamp 120316617 96270366>
20:37:33.956864 IP 10.2.3.3.56712 >
172.16.6.4.mysql: . ack 44 win 5840
<nop,nop,timestamp 96270372 120316617>
20:37:34.262669 IP 172.16.4.80.3389 >
10.2.3.3.35523: P 16:32(16) ack 1 win 17154
<nop,nop,timestamp 464627 96270349>
20:37:34.262756 IP 10.2.3.3.35523 >
172.16.4.80.3389: . ack 32 win 62882
<nop,nop,timestamp 96270402 464627>
20:37:34.397103 IP djc-gate.dnz.davidcoulson.
net.ircd > 10.2.3.3.50224: P 3537268066:3537268
240(174) ack 2761717574 win 5792
<nop,nop,timestamp 97499114 96269948>
20:37:34.397208 IP 10.2.3.3.50224 > djc-gate.
dnz.davidcoulson.net.ircd: . ack 174 win 62882
<nop,nop,timestamp 96270416 97499114>
20:37:34.400600 IP 10.2.3.3.33056 >
10.2.3.1.domain: 62556* PTR? 131.1.1.10.in-
addr.arpa. (41)
20:37:34.437222 IP 10.2.3.1.domain >
10.2.3.3.33056: 62556* 2/4/4 CNAME[domain]
  
```

2 Unwrapping the packet Mixed between the muddle of IP addresses, port numbers and TCP sequence numbers, lies everything most people need to know about the state of an IP connection or the content of a packet. As we can see certain packets, like those from DNS, will show up some very useful information about the content of the DNS request. One popular use of this is to watch DNS lookups by mail servers, which utilize RBLs for spam filtering and blocking malicious traffic on the network.



Monitoring DNS packets across a network enables us to inspect the specific lookups being performed.



David Coulson

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```
Ether 0.9.2
0x0040: 6564 0c62 6f6e 6465 6473 656e 6465 7203  ad.bondedsender.
0x0050: 6f72
22:00:52.577891 IP 172.16.6.4.42703 > 172.16.2.1.53: 2876+ A? 128.196.111.219.d
nsbl.sorbs.net. (49)
0x0060: 4500 004d 0000 0000 4011 d37a ac10 0604  E..M..9..0..2...
0x0070: ac10 0201 a71f 0035 0034 f8a7 0b3c 0100  .....5.9...<..
0x0080: 0001 0000 0000 0000 0331 3238 0331 3436  .....128.196
0x0090: 0331 3131 0332 3134 0564 6a73 626c 0573  .111.219.dnsbl.s
0x00a0: 6f72 6273 036e 6574 0000 0100 01
0x00b0: 22:00:52.574267 IP 172.16.6.4.42704 > 172.16.2.1.53: 2877+ TXT? 128.196.111.219
.sbl.spamhaus.org. (50)
0x00c0: 4500 004d 0000 0000 4011 d37a ac10 0604  E..M..9..0..y...
0x00d0: ac10 0201 a722 0035 0034 f8a7 0b3c 0100  .....5...<..
0x00e0: 0001 0000 0000 0000 0331 3238 0331 3436  .....128.196
0x00f0: 0331 3131 0332 3134 0564 6a73 626c 0573  .111.219.sbl.spa
0x0100: 6f72 6273 036e 6574 0000 0100 01
0x0110: 22:00:52.589422 IP 172.16.6.4.42705 > 172.16.2.1.53: 2878+ TXT? 144.235.114.68.
sbl.spamhaus.org. (49)
0x0120: 4500 004d 0000 0000 4011 d37a ac10 0604  E..M..9..0..z...
0x0130: ac10 0201 a722 0035 0034 f8a7 0b3c 0100  .....5.9...>..
0x0140: 0001 0000 0000 0000 0331 3434 0332 3335  .....144.235
0x0150: 0331 3134 0236 3003 7362 6c08 7370 616d  .114.68.sbl.spam
0x0160: 6861 7573 036f 7267 0000 0100 01
haus.org.....
```

tcpdump does not do a good job of inspecting the contents of TCP or UDP packets, which is where Ethereal has an advantage.

3 Filtering the flow We can look at just DNS traffic by creating a filter rule to show us only outbound DNS packets, which contain the specifics of the request:

```
# tcpdump -lni eth1 proto 17 and dst port 53 |
grep surbl
20:50:20.097033 IP 172.16.6.4.48837 >
172.16.2.1.53: 29237+ A? akamaitech.net.
ws.surbl.org. (45)
20:50:20.101143 IP 172.16.6.4.48837 >
172.16.2.1.53: 29238+ A? m0.net.ws.surbl.org.
(37)
20:50:20.112869 IP 172.16.6.4.48837 >
172.16.2.1.53: 29239+ A? victoriassecret.com.
ws.surbl.org. (50)
20:50:20.131898 IP 172.16.6.4.48837 >
172.16.2.1.53: 29240+ A? akamaitech.net.
sc.surbl.org. (45)
20:50:20.135754 IP 172.16.6.4.48837 >
```

```
172.16.2.1.53: 29241+ A? m0.net.sc.surbl.org.
(37)
20:50:20.147105 IP 172.16.6.4.48837 >
172.16.2.1.53: 29242+ A? victoriassecret.com.
sc.surbl.org. (50)
20:50:20.165552 IP 172.16.6.4.48837 >
172.16.2.1.53: 29243+ A? akamaitech.net.
ab.surbl.org. (45)
20:50:20.169121 IP 172.16.6.4.48837 >
172.16.2.1.53: 29244+ A? m0.net.ab.surbl.org.
(37)
20:50:20.180375 IP 172.16.6.4.48837 >
172.16.2.1.53: 29245+ A? victoriassecret.com.
ab.surbl.org. (50)
```

The filter consists of two separate checks. The first is for the IP protocol number, 17 being UDP (TCP is 6). The second checks that the destination port of the packet is 53, which is the port the DNS service listens on. If the source was 53, then it would be the response from the DNS server to the client. As we can see towards the end of each line, it is performing an A record lookup for a variety of hostnames within the surbl.org domain.

4 TCP capture Capturing data from TCP sessions is more complex, as the state of the connection needs to be considered. Unlike UDP, which simply throws the packet out there and hopes for the best, TCP performs a three state handshake before starting to pass data back and forth. Below is a failed attempt to connect to a system on port 23, where no server is listening on the remote end:

```
# tcpdump -lnvvi eth1 proto 6 and port 23
tcpdump: listening on eth1, link-type EN10MB
(Ethernet), capture size 96 bytes
20:57:18.740394 IP (tos 0x10, ttl 61, id
56382, offset 0, flags [DF], length: 60)
172.16.1.10.36809 > 172.16.6.4.23: S [tcp sum
```

PASSING SHOT

Generally, monitoring is done on an active network link which is passing traffic on the network, including the traffic we wish to monitor.

Notwithstanding any technical limitations of the switches or routers on the network, we can craft a passive bridge, which we can use to monitor traffic using a simple Linux box with a pair of Ethernet NICs.

Using the bridge tools, one can create a 'br0' interface, which has 'eth0' and 'eth1' as slaves, and will pass the Ethernet frames between the two interfaces without modifying them at the IP level. For all intents and purposes, the bridge will be completely invisible to the outside world, including either end of the session, and we can dump all of the packets which are being passed across the link for further analysis.

Take the high view with iptraf

For high level network monitoring, nothing beats this command tool...

While tcpdump is a great tool, if we care about sequence numbers, packet content and all the other low-level nonsense that floats around on the network, if we're only interested in seeing the number of TCP packets, the traffic level to port 80 or 443, or even simply the type of traffic seen on a network interface, iptraf is the tool for the task.

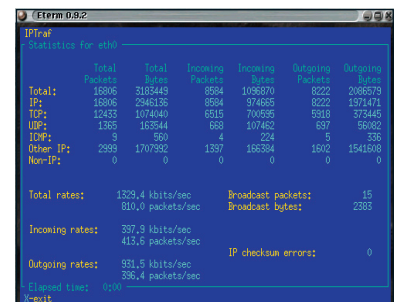
iptraf is a command tool that sets out to provide a high-level view of a network interface, from the number of bits or bytes transferred by a session, to the number of packets going back and forth on the network. This can prove very useful when trying to diagnose a

loaded network, where a tool such as tcpdump can't provide the analysis needed to distinguish between specific groups of packets, nor do anything practical with high traffic rates other than scroll the screen rapidly.

iptraf can also have filters set up to only watch specific protocols or IP packets, as well as Layer 2 data, including ARP and ARP frames. Being able to watch ARP packets on a network can prove massively useful, for instance, if a system is throwing out a significant number of ARP requests, it can suggest a configuration issue on the system as far as retaining ARP table information, or that is performing a port scan of the

local network. Of course, watching Layer 2 can also spot any device on the network, which may be passing out information such as ARP requests or Spanning Tree packets, which don't have an IP presence on the network as a whole.

On it's own, iptraf can only do so much, but combined with a more aggressive tool, such as Ethereal or tcpdump, one can very quickly track down any issue with a network without having to perform any reconfiguration which may disrupt network activity. ■



iptraf (<http://cebu.mozcom.com/riker/iptraf/>) can perform high-level analysis of packets, including packet count, protocol, connection state and data transfer rates.

Get some depth with Ethereal

tcpdump can be somewhat cryptic, but there is a GUI-based alternative

If you've ever tried to diagnose an issue involving something complex, such as a mail server not connecting to remote sites correctly, or OSPF failing to negotiate DR/BDR pairs correctly, you'll know that tcpdump is simply the worst application in the world to help with the problem. As tcpdump doesn't understand protocols, all it will do is

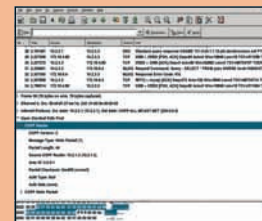
dump out the data from within the TCP, UDP or ICMP packet and spit it out in Hex or Base64.

Ethereal is very much like tcpdump, but it knows how the protocols within the packets are formed, and is able to display the contents to the user in a more useful form. Ethereal will even go so far as to unpack packets from

protocols such as AIM, Yahoo, or CDP.

As with any packet monitor, Ethereal can work on a passive span or tap, or actively on a router or end point.

It can also be fed the output from a wide range of network debugging tools, including those from Cisco IDS, Lucent network devices, or from the Microsoft Network Monitor tool, so using Ethereal



Ethereal (www.ethereal.com) provides deep packet information, including protocol specifics from the decoded data within the packet.

GOING FURTHER

While using a span or a tap is a great way to monitor traffic on a router or switch. Cisco, Juniper or Foundry routers and switches which support MLS can make use of the 'NetFlow' functionality to export flow, or connection, information from the device and dump it out to a remote collection server for further analysis, either in real-time or passively once the data has been stored.

There are a number of flow collection tools, a particularly useful one being www.mindrot.org/softflowd.html, which aggregates the total packets or bytes being transferred within the lifetime of a specific flow.

You can also use <http://ehnt.sourceforge.net>, which provides useful information, including the ASN of the source and destination of the packet. This can prove very useful when diagnosing routing problems, or isolating attacks, which may originate from a wide range of IP addresses, all advertised by a single ASN. Of course, there are also tools which output packet information from Unix systems and export them to a Netflow collector on the network. While Netflow may not be the most useful tool for deep packet analysis, it's very useful for monitoring traffic and hosts on a network. fprobe utilises libpcap, as do Ethereal and tcpdump. This can be downloaded from <http://fprobe.sourceforge.net>.

NEXT MONTH

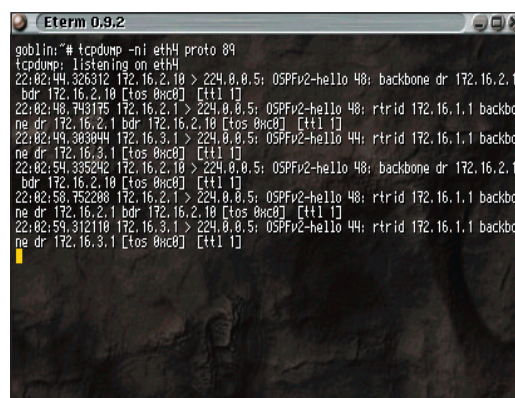
Next month Snort will be the IDS of choice for inspecting packets traversing our firewall

```
ok] 1324686109:1324686109(0) win 5840 <mss
1460,sackOK,timestamp 96388899 0,nop,wscale 0>
20:57:18.740426 IP (tos 0x10, ttl 64, id 0,
offset 0, flags [DF], length: 40) 172.16.6.4.23
> 172.16.1.10.36809: R [tcp sum ok] 0:0(0) ack
1324686110 win 0
```

5 Flag it up We start out by sending a packet, which has the 'S' flag set, otherwise known as the 'syn' flag. Rather than responding with a 'syn ack' to start the handshake process, our remote system tells us to give up by throwing an 'rst' back to us, as indicated by the 'R' flag.

6 Open it up If we hit the same system on port 80, where Apache is running, we can see the remote server respond with an 'ack' packet with the 'syn' flag set, then the client send an 'ack' back to indicate that the connection is open.

```
21:02:36.079887 IP (tos 0x10, ttl 61, id 9729,
offset 0, flags [DF], length: 60)
172.16.1.10.36868 > 172.16.6.4.80: S [tcp sum
ok] 1668113688:1668113688(0) win 5840 <mss
1460,sackOK,timestamp 96420633 0,nop,wscale 0>
21:02:36.079915 IP (tos 0x0, ttl 64, id 0,
offset 0, flags [DF], length: 60) 172.16.6.4.80
> 172.16.1.10.36868: S [tcp sum ok]
92735265:92735265(0) ack 1668113689 win 5792
<mss 1460,sackOK,timestamp 120466908
96420633,nop,wscale 0>
21:02:36.144767 IP (tos 0x10, ttl 61, id 9730,
```



tcpdump can have filters setup for any IP protocol, including IPSec, TCP, UDP or even OSPF.

```
offset 0, flags [DF], length: 52)
172.16.1.10.36868 > 172.16.6.4.80: . [tcp sum
ok] 1:1(0) ack 1 win 5840 <nop,nop,timestamp
96420640 120466908>
```

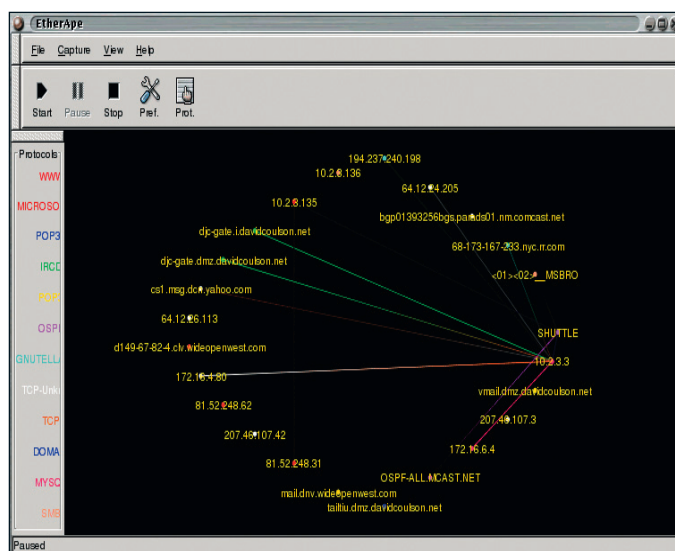
7 Understanding the TTL info We should also note that the TTL difference between server and client is 3, so there are three routers between the two devices. Not all systems start out with a TTL of 64, but as these are both Linux boxes running the same kernel, it's safe to assume our client's packets also started out with a TTL of 64. **PCP**

Get a visual with EtherApe

If you don't like complex logs and numbers, EtherApe is for you...

Often on a network, the most useful thing to know is which devices are talking to which other devices. We don't care just about the specifics of the packets; we want to know which devices are using which protocols. This can be used for many reasons, the obvious one being to check what malicious packets a compromised device on the network is throwing around.

EtherApe displays each protocol as a different colour, and draws a line, the width of which is based upon the amount of data being transferred in a specific direction. Depending upon where the traffic is being sniffed from, this will either produce a fan style diagram, with the local host being the base and everything it is connecting to being spread around the window, or a massive polygon with individual points being hosts on the network. On a sufficiently large network, the display should end up looking like a circle with every IP on the network being a point on the rim. ■



For those who like a graphical view of the network, EtherApe (<http://etherape.sf.net>) can capture data on connections between two or more systems.

This series	Part One	Part Two	Part Three
Introduction to MySQL	Installation and basic configuration	Tables, queries and data	Making real-world use of MySQL

MySQL programming on the web

PROJECT TIME



2 HRS 00 MINS

SKILL LEVEL



5 INTERMEDIATE
Some experience with website coding advised

YOU'LL NEED THIS



Web host running PHP and MySQL

Having a database isn't much good if we can't use it for anything. **Richard Cobbett** heads online to play around with the servers

MYSQL is an excellent database, but a database on its own is of limited use. We have to be able to read and write information via an actual program rather than manually entering every single new value into either the command line or Control Center. To do this, we're going to use the PHP web scripting language. This will enable us to keep any data that we want on our websites, summoning it as and when required.

For the sake of simplicity, we're assuming that you have a web host running both PHP and MySQL. You'll find MySQL at www.mysql.com, and PHP at www.php.net.

The advantage of PHP is that you don't need programming tools – just a text editor. When you try to access a PHP file, the server processes any commands that it finds, presenting the output, without making the programming code visible to anyone viewing the source.

1 A crash course in PHP We'll be looking at PHP in depth next month, but now we're interested in how it can control MySQL. Make sure everything works as it's supposed to. Put this into a text file, and name it 'helloworld.php':

```
<html>
<body>
<?php
$mygreet = "Hello World";
echo "<i>",$mygreet,"</i>";
?>
</body>
</html>
```

Upload this to your server and point your web browser at it. You'll see the words 'Hello World' on your screen. Should anything else happen, it means that PHP is either not installed, or has been misconfigured. Consult either your web host or the instructions, depending on whether you're online.

It's worth taking the time to see how everything clicks together. All of the code appears between '<?php' and '?>', with each line ending on a semicolon. The dollar sign in

\$mygreet tells PHP that we're dealing with a variable. Beyond that, everything is simple enough – we assign the words 'Hello World' to \$mygreet and print it out onto the screen using the echo command. This isn't limited to plain text – just by including the standard <i> italics tags, we've automatically styled up the result. The same applies to everything, from tables to images, and this is how we can start going about putting out database's contents into a more directly useful format.

2 Database handling We now hit the trickiest part of our project: setting up the database. The best way is to use a script like phpMyAdmin or CPanel, typically provided by web hosts to help administrate any online SQL databases attached to your account. Create a new database, in our case 'sqltest', and a user with full access to it. Use your config program to recreate the library database that we built last month. This will serve as an excellent demonstration of the basic commands. To connect to the database, use the following command:

```
$db = mysql_connect("localhost", "username",
"password")
```

Localhost means 'this machine'. It is possible to connect to other machines, but not necessary at the moment. Enter your username and password in the relevant gaps. Next, we tell the server exactly which database we want to access:

```
mysql_select_db("library",$db);
```

Here comes the tricky bit. This next line actually sends a query to the database, in this case pulling everything from our library into the variable 'result'. Note that it doesn't actually display anything – just reads in the necessary information ready to be printed out.

```
$result = mysql_query("SELECT * FROM
books",$db);
```

Now that we have our data, it's time to get some practical use out of it. We can pull our first line of entries straight onto the page, using the following code:

```
printf("Book: %s", mysql_result($result,0,"book
"));
```

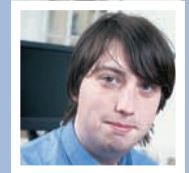
Rinse and repeat for the other fields. As you can see, it's very easy to get information out of a MySQL database. Putting it in, however, is rather trickier..

3 Insightful queries First and foremost, we need some information to slot into place. We could simply hard-code it into the PHP file, but that's pretty pointless; we'll almost never know precisely what information to slide in there. Instead, we want to set the page up as a web form. This way, we can add new information on the fly, using nothing more than a PHP query. The form itself is easy:

```
<form method="post" action="<?php echo $PHP_
SELF?>">
Book: <input type="Text" name="book"><br />
Author: <input type="Text" name="author"><br />
Publisher: <input type="Text">
```

Most major PHP scripts on www.hotscripts.com rely on a MySQL database to handle information. The alternatives are nowhere near as powerful.





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Richard knows the importance of organisation. He writes everything down on a piece of paper, and loses it with mathematic precision!

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```
name="publisher"><br />
<input type="Submit" name="submit" value="New
Book!">
</form>
```

Submitting it to the database is a matter of making a query. Despite what the name seems to suggest, this is how we make all of our major edits. First, we compile everything that we want into a single string, like this:

```
$newbook = "INSERT INTO books
(book,author,publisher) VALUES ('$book','$author',
'$publisher')";
```

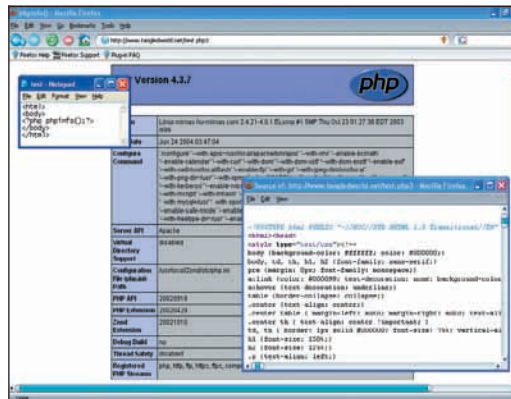
Next, we fire it into the database as follows:

```
$result = mysql_query($newbook);
```

4 All around the database This is the simplest form of SQL query, although all of the principle commands that you'll need to know follow a very similar pattern to it. In particular, you need to know DELETE and UPDATE – in other words, modifying the data in a table. This will probably look something like this:

```
$updatebook = "UPDATE employees SET book=' $book
',author=' $author',publisher=' $publisher' WHERE
id=$id";
$result = mysql_query($sql);
```

Of course, the real challenge isn't simply updating these tables, but using them to hold the information you need for your programs. Using just a handful of basic SQL commands, you can very easily create small but useful scripts – from simple banner advert scripts and random text generators, right up to visitor registration systems.



Before and after. The source code in a PHP file bears little relation to the page that your user finally sees. Just make sure that they can't grab the file itself via an FTP link.

5 Security However, whatever you plan to do, make sure that it's going to be secure. We've written our password and username straight into the script. This won't usually be a problem – it's not echoed to the screen at any point, so it won't appear when the user tries to View Source. However, if they can slip an FTP client through to the page and download it straight to their hard drive, the secret will be out in the open. As a result, most scripts are at least one level removed from their database connection – storing it in a separate file and including it as and when necessary. Simply copy the necessary commands into a separate file, such as db-connect.php3, and include this line in the main script:

```
include("db-connect.php3");
```

Upload the files into their respective directories, and run them exactly as before. **PCP**

GOING FURTHER

The advantage of using a system like MySQL is that there's never a shortage of documentation. From websites to mailing lists to dead-tree books, you'll never have trouble hunting down a particular piece of information. The main website at www.mysql.org has links to all of the principle sources, at all levels of complexity. One of the best can be found at <http://dev.mysql.com/doc/mysql/en/index.html>. This is a complete online guide, provided in HTML format for ease of searching.

NEXT MONTH

Next issue we'll be beginning a new Masterclass series.

What's new in 5.0?

Coming next year to a computer near you: the next major MySQL releases

First up is version 4.1. Despite being a point release, there's a lot of very powerful new features on their way. Most notably among these, is that MySQL has been given a UNICODE upgrade to cater for foreign users. Multiple statements can be executed using a single call (as well as adding the possibility to return multiple sets), an UPDATE IF EXIST key has been added to help keep databases up to date, and a HELP function is now available when working through queries.

Further away, we've seen the first glimmers of versions 5.1 and 5.0 – quite literally, due to the team's plan to amalgamate the results into one big

update. Major new features include cursor support, foreign key support for all table types rather than just InnoDB, advanced online back-up tools that won't hammer your performance, the ability to rename databases on the fly, make use of true VARCHARs and all manner of other useful features. For the complete list, take a look at the online documentation at <http://dev.mysql.com/doc/mysql/en/TOD0.html>. This also contains a number of other useful features, including a list of the things that the developers don't intend to bother implementing – specifically, nothing whatsoever – and features due for a nebulous future patch.

Of course, each revision also gives the base database code a healthy polish-up, offering speed and usability improvements for anyone who uses it on a day-to-day basis. Many features earmarked for future releases have already been partially implemented in current versions, and these are flagged up on the list. Forums, mailing lists and additional sources of information linked from the main MySQL site will be able to point you towards more advanced details of exactly what these do. Unsurprisingly, they're rarely the kind of thing that you need to be directly concerned about when starting out with the database. ■



Keep up to date with all the latest MySQL developments at www.mysql.com. There's plenty of information, whether you're using it commercially or for free.

This series	Part One	Part Two	Part Three
Building an online community	Creating your own forum	Mailing lists and more	Putting together the whole package

Online communities

PROJECT TIME



6 HRS 00 MINS

SKILL LEVEL



5 INTERMEDIATE
Tricky to set up, easy to maintain

YOU'LL NEED THIS



Web hosting service with the latest versions of PHP and Perl, plus a MySQL database

Richard Cobbett brings community management to the fore, with content management services capable of turning pages into portals

Over the last two issues, we've looked at many key elements of creating an online community – group editing with wikis, online forums for users to exchange thoughts and opinions, mailing lists to help get the word out, and a few other useful tools besides. To complete the series, we'll take a look at dedicated content management systems. This is a fairly wide definition, but not a difficult one – individual programs perform one task, a CMS handles the whole shebang. You get forums, news posts, article storage, photo-galleries, user-registration, advertising banners, and full plug-in architectures capable of handling everything from event planning systems to full-scale site editors.

Why didn't we start with these? Well, a CMS may be able to do almost anything, but that doesn't mean that you can just drop one into place. There's no best package, either – choosing one for your site is a matter of juggling what you want, what you actually need, and the downsides of the CMS you select.

The key disadvantage is one of design. CMS packages typically provide highly regimented websites – two columns down the left and right of the screen holding all of your options, with a wide central area to display the requested information. If you're used to designing with HTML and CSS, it can be very difficult to hammer this million and one nested tables into a distinct, friendly look. Secondly, once in place, you'll quickly find yourself tied down to it. It's much easier to break apart different packages, such as an advertising banner script running alongside your site, than a CMS' fully centralised way of working. Should problems emerge, it can prove impossible to escape from.

1 Window shopping These caveats aside, a CMS is the only way to run a community-based site. Installation varies dramatically according to the package that you choose to

use, but will invariably require up-to-date PHP/Perl support and a MySQL database. As ever, it's best to take a look at them up close and personal before going to this trouble, and the best place to do it is www.opensourcecms.com. All of its featured packages are completely free to download and use, and available to test online.

The biggest names at the moment, in descending order of complexity, are PostNuke, PHPNuke, Geeklog, Mambo and Drupal. A quick play with each one will reveal that they run along fairly similar lines – modules and blocks containing each key feature, arranged as and wherever you want them to appear. Actually using them, once up and running, is extremely simple. Not only can you set up everything from polls to articles, your users can submit content directly – even creating their own personal blogs and image galleries, if you choose to let them.

What you won't find from a quick test is how secure each package is. This is critical on anything more advanced than a basic ego-site, especially when you might have advertisers or legally important information tucked in the backend. PHPNuke in particular has lost a lot of ground in recent years, due to security holes and its maintainer's insistence on users paying a subscription fee for up-to-date versions. It's essential to ensure that you are always on top of these, and are comfortable upgrading your site when future versions are released. Above all, don't think you can just drop a CMS into your site – it'll take a long time to get it ready for use.

2 Practical editing We're going to take a detailed look at PostNuke. This will undoubtedly be familiar from many computing sites, not least our own sister magazine Linux Format (www.linuxformat.co.uk). It's a complicated system to get up and running, but has the advantage of additional flexibility when it comes to CSS and other layout requirements, offering all the benefits of PHPNuke, but with added stability and security features.

You'll find the live demo version of PostNuke on www.opensourcecms.com. Open it up and enter the admin username and password combination – at the time of writing this was demo/demo, but double-check if it doesn't work (it's possible that another user may have 'accidentally' changed it, in which case you'll have to wait an hour until the system resets itself. Annoying as this may be, it shows how much opportunity you get to play with the system). Once you're into the admin panel, head to the Administration panel. This breaks all of PostNuke's features down into an easily accessible form.

3 Picking a look First things first: it's worth playing with the sample templates on offer. The default brown look is unlikely to impress visitors, but there are plenty of others worth experimenting with (and of course, using as the base for your own modified templates once the system is up and running). You'll find the necessary option in the Settings

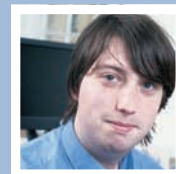


Head to www.opensourcecms.com and visit one of the best sites on the web. It's an excellent idea that's been perfectly executed. What's more, everything listed on it is freely downloadable.

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Richard's no stranger to online communities. Say hi on Tribe or Orkut. Or Friendster. Or LinkedIn. Or the PC Plus forum. Or...

panel, along with a choice of whether to allow users to pick their own favourite theme. For now, we'll use the rather more stylish PostNukeBlue.

This panel should give you some idea of how complicated PostNuke can get. There is a seemingly endless set of options, ranging from the timezone and site's security level, right down to whether there should be a funny error message when things go wrong. It's very easy to nail down exactly what you want your site as a whole to be able to do.

4 Uploading and downloading The rest of PostNuke's functionality can be accessed from the main Administration window. Everything has its own settings window, from Advertising Banners to Currently Active Polls, and more esoteric entries like Ephemerids (This Day In History style messages). These are used to automatically generate content on the site, as and when required.

One key thing to consider when using a CMS is that you have to work according to its own ruleset. Downloads are a perfect example. Rather than having to manually link and update your files, you can list and catalogue everything on your site – automatically uploading any necessary documents or executables, ready for your users to access. In PostNuke, this is primarily a listing service; other CMS packages tie it more tightly to file management tools.

5 Stories, blocks and modules The most exciting part of PostNuke is support for blocks and modules. In addition to the ones that come packaged in the download, you can plug in third-party scripts, or write your own – dropping HTML or PHP code into a text window so it is automatically executed upon display. Blocks have to be activated before they become visible, and assigned to the left or right side of the screen. It's a good idea to keep navigation on the left, saving more specific options for the right-hand side, although this will vary according to the kind of site you plan to build.



PostNuke (www.opensourcecms.com/postnuke) has no shortage of options. That's its biggest benefit – but it can be a curse if you just want to get your pages up and running.

Once the overall design has been finalised, it's time to begin adding content. The most dynamic part of a site (with the obvious exception of user forums) will be its news section. Whether you write this yourself or leave it for your users to submit suggested stories (which you will usually give the once-over), it's easy to keep everything tightly categorised and filed away for further use. One benefit of a CMS over a blogging tool or other direct posting utilities, is they can be configured to hold onto news stories and put them up when the time is right. This can be a great time-saver, especially when dealing with midnight embargos!

Spend time browsing through all the tools on offer. From automatically censoring words to turning them into Hyperlinks, creating banner ad campaigns, integrating forums like PhpBB and even sharing the administrative load across multiple administrators, there's no better way of getting your site running exactly as you want it to. **PCP**

GOING FURTHER

Do you have your own website? Regardless of whether it's a personal or business site, we want to see it. Send us the links at richard.cobbett@futurenet.co.uk, along with a quick note on how you went about building it, and any particular techniques you recommend. We would also like to hear with web technologies, and which online subjects you would particularly like us to cover in future issues.

NEXT MONTH

Next issue we'll be beginning a new Masterclass series.

Do you need a full CMS?

They may seem tempting, but you could well find them overkill for your purposes

One of the saddest sights on the Internet is a low-traffic portal based on Geeklog, PHPNuke or a similar high-end CMS with only a handful of users, empty forums, blank downloads, and a generic template. The fact is that sites like this have precisely no need for such a powerful package. Instead, they'd be best off looking for something more manageable, such as Drupal.

Drupal is a halfway-house between blogging tools like WordPress and MovableType, and the industrial CMS tools. It features a similar module-based method, and plenty of scope for expansion with full content syndication tools, personalisation tools, polls,

commenting, and a template engine based on standard HTML/PHP coding.

It's an unusual package, thanks to its focus on creating content rather than simply reading it, but very capable once you've put in the effort to learn its eccentricities. See the demo at www.opensourcecms.com.

Alternatively, there's always the mix-and-match approach. With a package like WordPress (www.wordpress.org) and a collection of scripts from sites like www.hotscripts.com, you can quickly put together a highly capable site, without being beholden to one particular technology provider. Rebuilding one element of your site is

always going to be faster than trying to migrate the entire thing. The only catch, is that you will lose out on having one central control panel that you can manage everything from – and of course, even more programs to keep watching for security holes and upgraded versions.

If you really can't find a CMS that suits your needs out of the box, you can contact any friendly programmers in the area and commission them to make one for you. Depending on your needs, the price should be reasonable – and this approach is guaranteed to offer the exact features that you'll require to take your business onto the web. ■



Drupal offers a way of dropping content management into your site, without having to face the millions of options on offer in more bloated packages.



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Robert Jaques has been an IT journalist for over 10 years, and has worked at the helm of a raft of prominent titles

business news

Edited by Robert Jaques

VOLWAN

Voice over WLAN technology cranks up the volume

Firms can simultaneously reduce communication charges and improve operational efficiency by deploying new 'Voice over Wireless Local Area Network' (VoWLAN) technology, industry experts have told PC Plus.

The technology, which routes all voice traffic within a company's office over wireless data networks, means that telephone cable installation costs can be eliminated, while at the same time, user productivity is boosted by 'smart' wireless phones, integrated with corporate computer systems.

"Firms with traditional telephony that are switching systems will usually pay a maintenance charge to their service provider, but VoWLAN means that this charge can be reduced or eliminated altogether by replacing the switch with a PC-based solution," explained Mark Main, senior analyst at market watcher Broadband@Ovum.

"Also, putting in data cable is enormously expensive, so there are potential cost savings to be gained if firms decide to replace traditional wired telephony and data infrastructures with converged VoWLAN."

Research from analyst firm In-Stat/MDR indicates that total global VoWLAN handset shipments are growing fast, with an annual growth rate of 120 per cent predicted for 2004.

Norm Bogen, director of In-Stat/MDR's Networking Research Group, added: "Much of the interest in VoWLAN has been in the expectation of combination cellular and Wi-Fi handsets, with a vision of the end user being able to switch seamlessly between cellular and WLAN networks, while simultaneously maintaining a call."

The research, *Voice over WLAN: Come On and Feel the Noise*, predicts that an emerging area of growth will centre on the handset space for small business users, where low-cost Wi-Fi handsets are used with residential VoIP services. By 2008, the analyst firm predicts that 15 per cent of VoIP subscribers with Wi-Fi home networks will have Wi-Fi handsets.

According to this study, of the firms that currently run VoWLAN, most use WLAN equipment from high-end WLAN vendors like Cisco and 3Com. Over half of the poll respondents stated that they use wireless PDAs as softphones run on the VoWLAN infrastructure.

Re-routing voice over WLANs can simultaneously boost productivity and cut down on costs.



CRM



Microsoft has promised enhanced integration between Office 2003 and its forthcoming CRM platform.

Microsoft focuses on Customer Relationship Management

Microsoft has unveiled a service pack for its forthcoming Customer Relationship Management package, Microsoft Business Solutions CRM 1.2, which it promises will provide better integration with Office 2003. This will make it much easier for users to perform CRM tasks, such as looking up customer data, without leaving Microsoft Office 2003 components.

The software giant said that the CRM 1.2 feature pack, due to be released as a free download for existing customers by August this year, would also usefully boost contact management and opportunity management capabilities on Pocket PC 2003 devices. We can expect the software to feature enhancements to the Sales for Outlook client; a

redeployment tool designed to enable the migration of Microsoft CRM among deployments, sites and application domains.

Anders Brown, group product manager for the Information Worker New Markets Solutions Group at Microsoft, told PC Plus: "Two already great products – Microsoft CRM and Microsoft Office 2003 – have already proved themselves to be powerful tools for conducting business more efficiently and supporting strong customer relationships."

The Microsoft Office 2003 integrations to Microsoft CRM will be available in both American and International English in August. Additional language packs are scheduled for release in the final quarter of this year.

NAS

Industry first: HP breaks into Windows-based NAS

HP has made an innovative move by launching a Network-Attached Storage (NAS) system, capable of consolidating Microsoft Exchange Server 2003 data on Windows Storage Server 2003-based NAS systems.

According to HP, its StorageWorks NAS 2000s and 1200s offerings are designed to allow small- and medium-sized businesses (SMB) to slash IT expenditure by consolidating file, print and Exchange servers by up to 50 per cent. The devices incorporate the recently released Microsoft Windows Storage Server 2003 Feature Pack, with support for Exchange Server 2003.

Marcus Schmidt, senior product manager for Windows Storage Server 2003, Microsoft, told PC Plus that the HP NAS devices were able to simplify the management of fast-growing data stores, especially mission-critical email.



HP claims that its StorageWorks family of devices enables firms to reduce their total number of file, print and Exchange servers by as much as 50 per cent.

PIRACY

FAST and hard justice for UK software pirates

The Federation Against Software Theft (FAST) has vowed to clamp down on software pirates in the UK. The move is influenced by recent research, indicating that almost half of British firms admit that commercial software piracy is on the rise.

FAST said it was “declaring war” on pirates, and promised to use criminal proceedings to crack down on organisations that are using software illegally. The Federation warned that its hard line would increase the risk of company directors going to jail – for up to 10 years – and businesses failing if they use unlicensed software.

John Lovelock, manager of the Federation and Legal Affairs, cited research predicting that some 40,000 jobs could be created in the UK if software piracy were eradicated. “This is not just about using illegal software,” he said. “It’s about the economic health of the country.”



FAST executives John Lovelock (left) and Julian Heathcote Hobbins vow to eradicate software piracy in the UK.

NEWS

Top stories → In-depth analysis → Expert opinion



The Many Deaths of Email

With spam on the increase and no solution in sight, is it time for an email alternative?

by Richard Cobbett

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Could you live without email? People have been asking that since the dawn of the Internet – but now we face a more disturbing question, whether we actually can. There are no prizes for seeing just how strained the global email system has become over the last few years, ranging from its gullibility when facing a lying user, to the resulting flood-turned-deluged-turned-tsunami of spam, viruses, and other computing headaches. Clearly, this can't be allowed to continue.

The problem is that email is now so widespread that there's no easy way to head back to basics without risking total fragmentation. The various factions pushing their respective favourite technologies haven't forgotten this – Microsoft is pushing a system called Caller ID, while Yahoo! and other big names have lent their weight to Sender Policy Framework; increasingly amalgamated into one standard. In

essence, this involves checking whether or not a piece of mail actually comes from the server it says it does, punching out the opportunity for fraud, and making it easier to blacklist troublesome addresses on an Internet-wide basis. Spotted the problem? Yes, those pesky spammers can just move to a different machine. And of course, will. There's no magic bullet, save possibly one through the head of everyone responsible for trying to force their rubbish down your throat.

Sidestepping spam problems

Sadly, the trick at the moment isn't so much beating spam as sidestepping it. A spam filter between you and your mail server may prevent you personally seeing a message, but does nothing to help cut-down the bandwidth wasted to get it and its 9999999 brothers and sisters to their intended destinations. Blacklists, whitelists, Bayesian filtering, fuzzy logic – they only ease the strain

on individual users. Obviously, spam filters could cut in much earlier, but doing this greatly increases the odds of 'false positives' – genuine email sentenced to e-death simply for looking suspicious. Mailing lists and e-commerce notifications (such as Amazon's confirmation of a purchase) are especially susceptible to this.

Plenty of new anti-spam measures are in the works. Bill Gates has been picking up a lot of press for parroting an old idea called Penny Black, which would force computers to perform a simple calculation before sending off each email. No problem for one or two, but one or two million is a very different story. A social networking solution to the problem can be found at www.mindswap.org/papers/Trust.pdf, basing spam scoring on relationships rather than pure contents. And of course, there's no shortage of more collaborative methods, such as Cloudmark (www.cloudmark.com) that

STOP PRESS!

US DOJ goons will be tracking the development of Longhorn to ensure it complies with the recent antitrust ruling, forcing it to embrace other 'middleware' products such as web browsers and media players.

can instantly respond to new spam alerts and block their signatures around the world in a matter of minutes. More direct approaches include; trying to track down the spammers themselves, throwing the book at them in court, adding sites to blacklists, and converting traditional mailing lists into RSS feeds – a technology that is due to be available in Apple's Safari web-browser and Windows' Longhorn.

It's largely a losing battle. For every suggestion, there's a way for the spammers to get around it – either by throwing money at the problem (and with hundreds of thousands of dollars at stake, there's a lot of money to throw...) or relying on the fact that tracking them down will cost far too much for even the likes of Microsoft to catch them all. It's a gamble, of course, but a depressingly lucrative one.

Alternatives to email

Luckily, there are ways around it. Unluckily, none of them has the same fire-and-forget ease that has made email such a popular medium. Instant Messaging offers the perfect example. Almost no competing program or protocol, makes any concessions to sending messages to offline users, forcing you to wait until somebody pops-up on your screen. Secondly, there's no one protocol. Everyone, from Microsoft to AOL to Yahoo! and ICQ

have their own closed networks, designed to prevent interoperability. The one major free protocol, Jabber, is growing in popularity, but has nothing even approaching the same userbase. Try Pandion (www.pandion.be) if you're looking for a dedicated client, or Trillian (www.trillian.cc) for a third-party package that can connect to everything, thanks to quickly reverse-engineering the respective protocols. As we said in our Instant Messaging group test, this situation is insane. The Internet was designed to run on open-standards, and such short-sighted flag-waving only serves to send it crashing down on our respective heads.

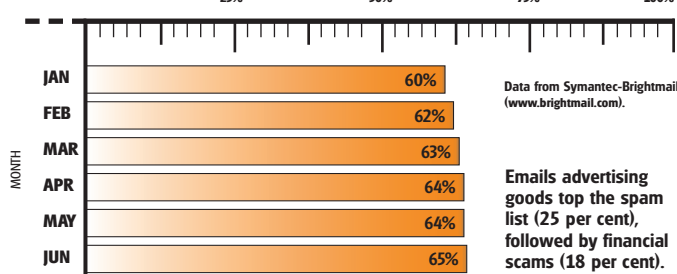
Gloom and doom

Ironically, Instant Messaging has historically had many of the same problems as email. The original big-name service, ICQ had terrific difficulty with instant message spam. While doomsayers will have us believe that IM is next on the list of targets, in practice, it's much easier to avoid potential troublemakers simply by using a whitelist of people who can communicate with you, and banishing everyone else. Of course, this isn't usually practical for email, when you never know who might get in touch.

Alternatives? Yes, we've got a few. Wikis, forums and other collaborative working tools provide a good way of communicating within specific teams, with private messaging offering a way of sending anything that doesn't need to be shared with the world as a whole. You can even use services like blogs, to keep track of what you're doing – either online, or safe behind a good, solid firewall. Or, if you want to be really advanced, there's always older technology, like the telephone...

Internet email identified as spam in 2004

PERCENTAGE OF INTERNET EMAIL FILTERED BY BRIGHTMAIL IN 2004



APPLE

A 'Tigerish' approach to Longhorn

It's the 'great innovator' vs. the 'great imitator' as Apple unveils its new OS and takes a sideswipe at Microsoft



Apple believes we'll see components like iChat in Microsoft's Longhorn OS.

At this year's Worldwide Developer Conference (WWDC), Apple CEO Steve Jobs previewed the next version of its Mac OS, codenamed 'Tiger'. He claimed that this 10.4 version boasts 150 improvements, and if the company's banner ads were anything to go by – a large Tiger OS X logo with "Redmond, start your photocopiers" emblazoned above it – Apple expects knock-off OS X features to appear in Microsoft's Longhorn software.

But who's copying whom? The highlight feature in Tiger is the real-time search functionality called Spotlight. This integrated metadata search engine can sift through all of the information stored on a Mac's hard disk, in pursuit of a defined search query. The results are displayed in categories; documents, calendar entries and so forth, for easy reference. But it's hardly a new idea. Microsoft may be lagging behind Apple in OS development, but the Longhorn filing system is focused on the same intelligent storage of data. Like Spotlight, WinFS uses an SQL relational database that can be searched by file properties and metadata tags. This enables you not only to query direct data, but also to search by the hidden information associated with them (that is,

photos taken on a certain date). As hard disks expand from megabytes to terabytes, such a versatile file storage service will be vital in accessing our data in the future.

While there's a distinctly ho-hum feeling about many of the features in Tiger, what it does do is put pressure on Microsoft to deliver an OS that's just as capable, and at least 75 per cent as pretty. There are fewer innovations here for Microsoft to be 'inspired' by. Like Tiger, Longhorn promises to be 64-bit capable and to feature integrated RSS feeds. Similarly, Apple's new Dashboard feature sees 'desktop widgets', Java Scripted mini-apps such as stock-tickers, email alerts and quick-links. But it's nothing the Longhorn Sidebar can't rival.

If Microsoft wants to be 'inspired' by Cupertino's fifth OS launch in five years, hope that they come up with something as good as Tiger's iChat application, with its stylish video conferencing windows. And Longhorn would certainly benefit from a barely-disguised clone of Tiger's new scripting engine, Automator.

Apple has undoubtedly got its nose in front in the enduring OS race. But however clever Tiger is, it probably won't dent Microsoft's dominance. – **Dean Evans**

THE MONTH IN NEWS

More **micro-payment** fun. Peppercoin was a system aimed at avoiding credit card fees that handed-out payments to content providers, according to statistics, rather than direct site purchases. The new version keeps the name, Peppercoin 2.0 but removes the vagaries, handing-out cash as and when requested...

... They say a hit of **Java** makes you hyperactive, but Sun has really pushed it to the next level – upgrading its language from 1.5 to 5.0, overnight. Still no word on whether it's actually going to be open-sourced and thus hopefully pick up a wider audience, but the company is definitely pushing the name as a brand...

... Forget Longhorn's Avalon GUI, in the open-source world we have Project Looking Glass – a **3D desktop for Linux** systems. Available as both a windowed application and a fully-fledged "Hey, It's A UNIX System, I Know This" desktop experience, you can download it from <https://lg3d-core.dev.java.net/>...

INTERNET

Battle of the Search Giants: Round 2

If Microsoft wants to take over the world, it will have to beat Google at the searching game. A new MSN search is a start

Microsoft is currently testing its brand-new search engine – at the time of writing, this was running in open-beta form at <http://techpreview.search.msn.com>, although it may or may not still be active by the time you read this. Either way, there seems to be little reason to run and check it out, apart from the fact that it's due to take over the searching duties on MSN. The current version has no standout features, bar a basic 'Preferences' option that enables you to report incorrect searches in a variety of forms; from dead web links to inaccurate descriptions. Pitched against the might of Google, we don't see it taking off as a solid replacement just yet.

Here's the real standout problem: it doesn't do anything new or improved. Any search engine looking to compete on its own terms has to be able to offer both. Google's real masterstroke was in pushing slimline searches rather than bloated portal pages, followed by unobtrusive ads, instead of pay-for-position or sponsored links systems. You really can't pare things down much more than a text box and a button to kick off the search.

Unless Google spectacularly explodes during its new public life (unlikely), handing the reins to Teoma, or another competitor, there's not much that can be done to change this.

The next round is a very different story. Put simply, it's going to take place on the desktop rather than the web and here, Microsoft has home-field advantage. There are programs around to search for documents, such as Blinkx (www.blinkx.com), and integrated search engines like the Google Desktop, but only one company will be able to build it into the operating system itself.

With full indexing, live web links, and integration into packages like Office, the question immediately spins on its head. Will Google be able to compete on the enemy's home turf when it launches its own PC search tool, Puffin? While it will have several years to build up a following, MS will certainly be watching its every movement like a hawk – and as with IE, its replacement doesn't have to be a quantum leap forward if it's 'good enough' for the average user. – **Richard Cobbett**



The revitalised MSN Search has a fresh, clean and simplistic feel... much like another popular engine.

3G VS 4G



4G Wi-Fi threatens the 3G revolution

Third-generation wireless faces competition from cheaper wireless systems. Is 3G really dead in the water?

Four years ago, UMTS (3G) seemed like the solution to all our mobile connectivity needs. It promised to offer seamless mobile data access at speeds of up to 2Mbps, enough for fast Internet access and for half-decent, low-resolution streaming video. While technology futurists dreamed of videophones, European telcos planned for high-premium interactive services – online ticket-booking, downloadable video clips and location-aware mapping. Billions were thrown at licences. It all seemed a good idea at the time.

But analysts suggest that the 3G standard is increasingly looking dead in the water. Its adoption hasn't been helped by a slow rollout – 3 (www.three.co.uk) was the first to unveil a full, consumer service in 2003, while 2004 has seen Orange, T-Mobile and Vodafone launch their own data services. The disappointing subscriber numbers for 3's network has shown that there is, as yet, no compelling content to drive people from the current GSM/GPRS networks to 3G. For business users, however, the benefits of 3G's 384Kbps download speeds (with 64Kbps uploads) are obvious, although they are nowhere near the once promised 2Mbps speeds.

Fans of the emerging IEEE 802.16 standard, dubbed WiMAX (www.wimaxforum.org), have suggested that Wi-Fi roaming has the potential to dent 3G's hopes of a revival. Broadband providers are already anticipating the development of 4G Wi-Fi-enabled mobile handsets, which will enable users to bypass traditional mobile phone networks in favour of faster and cheaper Voice over IP comms. WiMAX, with its touted range of up to 30 miles, has the potential to provide blanket wireless broadband coverage at significantly less cost than 3G.

Nevertheless, 3G will still develop – the major telcos have ploughed far too much money into the technology to allow it to fail. 3G networks are also here now, while the 4G concept is exactly that; a concept. But the quick rise of Wi-Fi, the growth of wireless hotspots and the prospect of WiMAX, mean that an IP-based network could become an attractive alternative. Wi-Fi-enabled phones are already beginning to appear. In the future we may be subscribing to The Cloud (www.thecloud.net), rather than Vodafone. – **Dean Evans**

STOP PRESS!

Recent flaws in Internet Explorer have increased the popularity of the Firefox browser (www.mozilla.org). In a PC Plus poll, 46 per cent of those polled had switched to Firefox, 54 per cent are sticking with IE.

THE MONTH IN NEWS

... Dell has signed a deal with **Lindows.com** to bundle the Linspire distribution with new PCs. This ties in directly with Dell's new music player and Lindows' Lsongs application. Purchasers get a year's access to the Click and Run warehouse, where they can download new software for their system – after that, subs apply...

... Online encyclopaedia **Wikipedia** has reached the dizzying heights of 300,000 entries. That's over 90 million words in total, contrasting well against the Encyclopaedia Britannica's 85,000. Wikipedia is written by its dedicated readers, with everyone able to add their own entries on just about any subject they can imagine...

Moore's Law

The release of Fahrenheit 9/11 sets Chris thinking about the medium as well as the message...

Last month I saw Michael Moore's Fahrenheit 9/11, a devastating indictment of George W Bush and his response to the World Trade Center tragedy. No, I wasn't at the premiere – I was in front of the TV in our bedroom watching a copy I'd downloaded from the Internet. This act of 'piracy', by the way, has the full approval of the man himself. "I don't have a problem with people downloading the movie and sharing it," Michael Moore told the press after the premiere, "as long as they're not trying to make a profit off my labour. I made this film because I want the world to change. The more people who see it the better."

Hollywood hates loose talk like this. Online piracy, it claims, is costing billions of dollars in lost sales. Only tighter technical and legal protection can save the movie industry from extinction. So it boils down to "We gotta find a way to stop people watching our movies."

Here's where the world divides. Michael Moore's Law says: the primary function of my movies is to be seen. Hollywood, on the other hand, is showbusiness with the emphasis on the last two syllables. If stopping

people watching movies is the way to make money (they think), that's where resources will be directed. That's what the US Senators will be lunched about. That's where the hired computer programmers will be pouring their ingenuity.

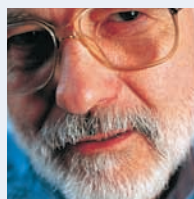
The width of the chasm dividing these two cultures hit me like a brick a couple of days ago when I was talking to Jeff Sasagawa, director of market development with the US company MIPS, the embedded processor people. Jeff is looking forward to a proliferation of set-top boxes and other proprietary devices that control the flow of data into our homes from service providers. Encrypted programs stream in by satellite and cable, are captured on to the domestic PC entertainment server in the cupboard under the stairs, and from there are networked to TV, hi-fi sets and personal portable players around the house. While whizzing around your house, the data will be locked down every inch of the way. Only the service provider holds the key. It dictates what songs can be played where, and on how many of your TV sets particular movies can be shown. And it guarantees (to Hollywood and Big Music) that none of this material gets out through your front door.

I couldn't relate to any of this. Not that I couldn't grasp the technology, or even that I particularly quarrelled with the legal aspects. It just felt as if I was talking to someone trying to sell me a sofa stuffed with live, hungry rats.

As a UK citizen, all my life I've been used to high-quality broadcasting from the BBC, along with the mostly high standards from the free-to-air commercial channels.

Chris Bidmead
chris.bidmead@futurenet.co.uk

Chris Bidmead has been using and writing about computers for more years than he cares to remember



"I WAS TALKING TO SOMEONE TRYING TO SELL ME A SOFA STUFFED WITH LIVE HUNGRY RATS."

Yes, there's Sky, but that's a novel sideshow. Here in the UK, we see the future being set out in schemes like DAB and FreeView – a digital continuation of the 'entertainment commons' that our parents and grandparents traditionally enjoyed on the basis of a modest BBC annual licence fee.

In the States it's the other way round. Jeff sees 'free TV' as mere wrapping paper. If you want decent entertainment – The Sopranos, for example – you subscribe to HBO. And HBO will of course, have to protect its content, otherwise why would people want to pay for it? Up-to-the-hilt DRM is a no-brainer, according to Jeff.

The BBC broadly follows Michael Moore's Law – it exists to create material that people can get hold of. Yes, the licence scheme makes everybody pay for it, even those who think they don't want it. But this turns out to be much more economically efficient than the 'top-slicing' approach, which

delivers content only to the small percentage of those who opt in with their credit cards. Look at it like this: if I make a programme financed by just one per cent of a scattered population, what's the real economic

cost of relaying that to the other 99 per cent? Close to zero.

The BBC's White Paper (www.bbc.co.uk/thefuture/bpw/paying.shtml) reminds us that like street lighting and public parks, digital content is of its nature a public good. If I download Fahrenheit 9/11, that doesn't stop you doing the same – in fact, modern P2P technologies like BitTorrent make downloading faster when more people use it. Public goods locked down with subscription and DRM tend to be priced too high and under supplied. "As a result," says the White Paper, "some people who could have consumed the good at no additional cost go without. These welfare losses represent a market failure... an inefficient allocation of society's overall resources."

Nobody in the States (except Michael Moore) will understand that last sentence, if only because it includes the word 'welfare'. See what I mean about the gulf?

Michael Moore's Fahrenheit 9/11 is already available on the major P2P sites.

22-03	Exorcism of the Executive Branch	32 Mb	1	0	Workprint	vftr
22-03	Exorcism of the Executive Branch (hi...	155 Mb	3	2	Workprint	vftr
28-06	Fahrenheit 9/11 Screener	1051 Mb	1329	4289	Cam	JLP
28-06	Fahrenheit 9/11 Screener on DVD	2048 Mb	513	2511	Cam	JLP
27-06	Fahrenheit 9/11 CAM-POT	1076 Mb	759	2479	Cam	anonymous
29-06	Fahrenheit 9/11 CAM-POT	1076 Mb	91	121	Cam	anonymous
25-07	Fahrenheit 9/11 POT vcds reencoded in...	700 Mb	121	541	Cam	Albo
26-06	Fahrenheit 9/11 Trailer - MPG	23 Mb	18	4	DVD-rip	KennyGuk
25-07	Faster vobs	3899 Mb	1	46	DVD-rip	gooberman
24-06	Fog of War - 2003 (MP4) [Hi-Quality]	904 Mb	25	113	DVD-rip	phovtuchte
31-05	football factory dvdrip rmvb	321 Mb	10	18	DVD-rip	jtb
26-06	IBCAMEPS 3 documentary	480 Mb	21	25	DVD-rip	anonymous

THE MONTH IN NEWS

... It hasn't been Microsoft's month when it comes to publicity. First, CERT recommended getting rid of IE in favour of **Mozilla Firefox**, then the US Department of Homeland Security jumped in, and by the end of the month, even Slate – Microsoft's own Internet mag – was pushing the open-source contender...

... The EFF has announced **10 Internet/software patents** that it plans to try and have overturned. The list takes in a wide range of companies, from Nintendo and Clear Channel, down to one individual businessman, but all are claimed to be against the public interest, and susceptible to prior art attacks...

... And speaking of the EFF, it also has its teeth into Orrin Hatch's new **INDUCE Act** – American legislation with the potential to criminalise everything from CD burners to the iPod, on the grounds that they induce people to commit copyright infringement. Read a mock complaint at www.eff.org/IP/Apple_Complaint.txt...

INTERVIEW

Modular Mobile Graphics

Nvidia and ATI fight to be the standard-bearer for upgradeable laptop graphics

At Computex 2004, Nvidia demonstrated its idea for the future of notebook graphics, dubbed the Mobile PCI Express Module (MXM). Designed as a modular solution, the MXM project aims to reproduce the power and swappable nature of desktop PCI Express cards. The prospect of upgradeable graphics will do much to extend the longevity of laptop designs – together with the processor and the LCD panel, it's one of the parts that can't be changed. PC Plus spoke to Rob Csonger, general manager of Nvidia Mobile and Embedded Business, about the prospects for this technology.

Q. What has hampered the development of such a module previously?

A: AGP has been the de facto standard for a while, with no real opening for the change of manufacturing practices. The introduction of PCI Express graphics has proven to be an ideal opportunity to introduce a modular system.

Q. How are current GPUs/VPUs mounted in notebooks?

A: Traditionally, laptop manufacturers create their own proprietary PCBs to fit the design of their own laptop. This is especially true of the larger companies. As a result, each laptop and solution is invariably unique, and requires the manufacturer to retool its fabrication process. This involves changing the assembly line, but it also introduces a whole new set of new tests for power consumption, heat and durability. It's a time-consuming process.

Q. Will upgrading a graphics card be as easy as plugging and unplugging such a card in a desktop PC?

A: MXM was designed from the beginning to support upgradeable graphics. However, the benefits of MXM extend far beyond field (in other words, consumer) upgradeability – it reduces the engineering burden for the entire industry by leveraging Independent Hardware Vendor (IHV) reference engineering designs. This allows faster time to market for the latest products.

Q. How does MXM work?

A: The MXM-I, -II and -III connectors are robust, low-cost, single-connector solutions that handle all display and PCI Express signals. In addition to 16-lane PCI Express, the MXM connector also handles electrical signalling for: Dual-link LVDS, VGA, SDTV, HDTV and two independent DVI ports.

Q. What has been the feedback on MXM from notebook manufacturers?

A: MXM has been received very warmly by all the manufacturers that we've approached. The new standardised connector for PCI Express graphics cards



Nvidia's MXM module offers true plug-and-play upgradeability for notebook computers.



means that producing new laptop designs is greatly increased in efficiency. Time to market can now effectively be three months, instead of the traditional 12 months for proprietary designs. The world's leading notebook, Original Design Manufacturers (ODMs) – including FIC, Uniwill, Clevo, AOpen, ASUSTeK and Mitac – all intend to offer notebooks with MXM.

Q. What sort of performance benefits will Nvidia's proposed MXM GeForce 6 Go solution bring to notebook computing?

A: Due to the efficiency of the new architecture, the GeForce 6 series offers several times the performance of the GeForce FX series, but still remaining within the same thermal and power budget.

The first and most obvious benefit is the fact that games will, in theory, play several times better in terms of frame rates (leaving aside the great new features that GF6 incorporates, such as Pixel Shader 3.0). And to get more out of your battery life, you can now down-clock graphics cards and play existing games at only fraction of the previous power budget.

Q. Will MXM-based notebooks be restricted to Nvidia-powered cards?

A: No, MXM has been designed to cater for all hardware manufacturers, including our competitors. In fact, it was a stipulation of the laptop manufacturers that it was compatible with all kind of graphics chips.

Q. Will MXM continue to be developed, regardless of its acceptance?

A: MXM has been in development for some time now, with the full co-operation of all of the laptop ODMs. Its universal design and increase in efficiency is a very attractive proposition to any company – this will drive adoption of the interface, regardless of whether our competitors support it.

“MXM IS DESIGNED FOR ALL MANUFACTURERS, INCLUDING ATI...”

MICROSOFT

Windows XP64 to be OEM only?

Today's Athlon 64s may not be as 'future-proof' as you hope

Want to buy the 64-bit version of Windows XP in September? You won't find it on a shelf in Dixons, if rumours sweeping the web this month are to be believed. According to The Inquirer (www.theinquirer.net), Microsoft isn't planning to sell Windows XP 64-bit Edition for 64-bit Extended Systems at retail, opting instead to distribute it through OEMs, presumably on new systems. When asked to clarify the situation, Microsoft would neither confirm nor deny web speculation, saying that Windows XP64 would be: "available with new 64-bit Extended computers from several OEMs in the second half of 2004."

Off-the-shelf (literally)

The rumour was given credence by the comments of a Microsoft product manager, Brian Marr, who seems to have posted details of the strategy on to a newsgroup. It suggests that end-users who currently own a 64-bit-capable Athlon 64 system won't easily be able to upgrade their existing Windows XP OS. It's possible that Microsoft wants to avoid confused consumer purchases, and the

nightmare of providing technical support for a multitude of different upgrade scenarios. On the one hand, an OEM approach enables the software to be tested and certified on the hardware supplied with it, thus avoiding uncomfortable incompatibility problems. It's a method that has worked well with Windows XP Media Center Edition, although it has severely limited the impact of Media Center machines as a result. The flip side to the OEM-only route, is that it may leave a growing population of current 64-bit processor owners (who bought into AMD's 'future-proofed PC' marketing spin) stuck with a system that's unable to realise its full 64-bit potential. Angry words all-round.

While selling Windows XP 64-bit Extended Systems Edition via OEM channels, will be Microsoft's official and preferred policy, there will doubtless be ways to legally obtain the software through other channels. Microsoft's own licensing rules state that: "OEM products are designed and licensed for distribution and sale with a new PC". But it also adds that, in some cases, OEM versions of its software may be sold "with a non-peripheral computer hardware component." So we may find versions of Windows XP64 sold with low-cost extras such as a hard disk drive or a new motherboard.

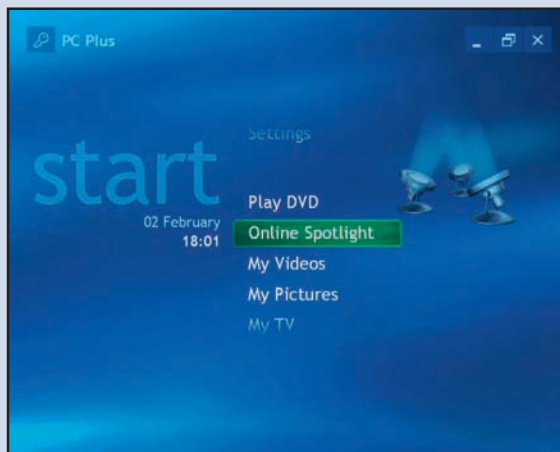


If Microsoft won't be selling Win XP64 as a standalone product, why buy an Athlon 64?

Win XP64 under the counter?

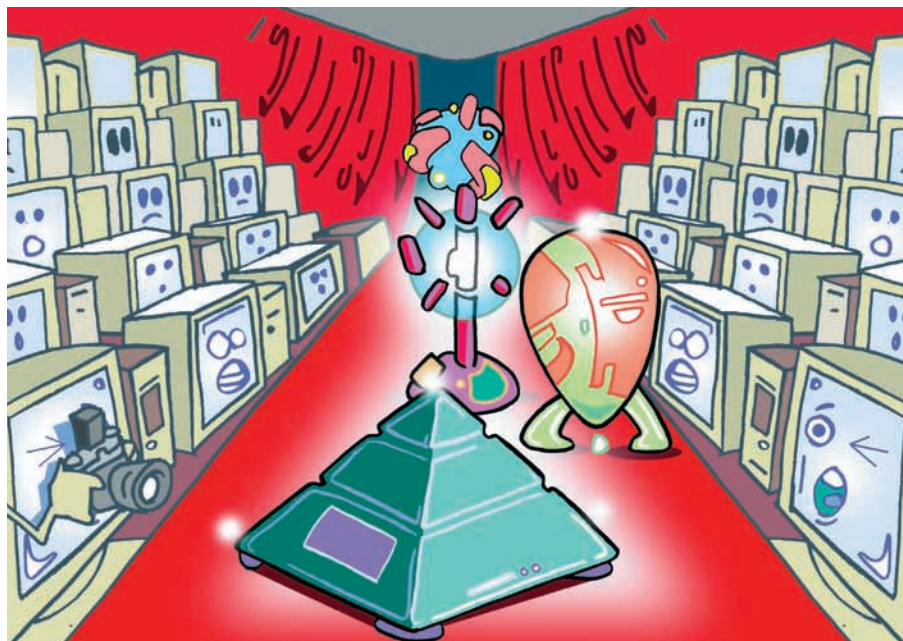
You can already see this buying option available with Windows XP. While the retail version of Windows XP Home Edition has an RRP of £179.99, web sellers such as Disking Computers (www.diskingcomputers.co.uk) are selling an OEM version for only £64.40 – as long as you purchase the appropriate "non-peripheral computer hardware component" to go with it. Other websites offer a similar deal, but it's vital to understand the rules of sale – there are no returns, no refunds and, crucially, no technical support.

It's feasible that a similar system will operate when Windows XP64 eventually appears, targeting enthusiast Athlon 64 owners, who have the technical knowledge to tackle compatibility niggles. It is, however, worth noting that Windows Media Center Edition has never been made available in this way. So those angry words may well be justified after all. – **Ian Robson**



The impact of Media Center has been hampered by an OEM-only policy.

HARDWARE



New styles for old desktops

New designs and new uses will move the traditional PC away from the 'tower'

The nature of the PC is changing. In 2001, PCs were chunky tower systems with CRT monitors and every peripheral was resolutely beige. Into 2002 and, while the stout cases remained, hints of colour had begun to creep in, while 14in and 15in LCDs were becoming increasingly commonplace. But in 2003 and 2004, the hardware landscape changed dramatically. PCs became bolder, Perspex-panelled and neon-lit. Small form factor Shuttle systems and desktop replacement laptops provided compact alternatives to the traditional tower and, most recently, PCs have raided home entertainment territory, led courageously (if unsuccessfully) by the Media Center PC.

But where does the PC go from here? There's no doubt that the lines between computing and consumer electronics are drifting together, but the gap can still be described as 'gaping'. It's true to say that PCs need to get simpler and cheaper to appeal to a mainstream audience. But CE devices can

learn a thing or two from the flexibility of a modern PC and its ability to adapt to the changing technological landscape.

If CE devices followed a more modular design ethic, you'd be able to pull out the DVD drive in your current DVD player to replace it with a next-generation HD-DVD unit when such a module



The Kessler 'Entertainment PC' concept is at odds with the idea of a hidden 'digital content server'.

became available. No need to buy a whole new DVD player. Similarly, if Microsoft offered a reduced, menu-driven option within the Windows XP OS, novice users would be able to avoid the submenus and control panels that can make home computing a frustrating experience.

The shape of things to come

Infinium's forthcoming Phantom games console (www.phantom.net), shows just how a reduced front-end can sit on top of the traditional Windows XP GUI. The Phantom is effectively a 'closed PC', using a proprietary interface to limit user options. PC games are modified to fit the system, and because they are downloaded from the Internet via broadband, there's no fiddling and no unexpected incompatibilities. At the same time, the Phantom can also be upgraded to keep pace with advances in chip speeds and graphics. It may not have the marketing to catch on in a crowded market, but it's effectively a CE makeover of a rigid IT system.

Computing has moved into a halfway-house stage in its development, and an interesting split has developed. In the red corner, digital home enthusiasts talk excitedly about entertainment servers – hidden PCs with colossal hard drives designed to download, store and stream digital content to secondary devices within the home. It doesn't really matter what they look like.

In the blue corner, Intel is pushing the idea of the Media Center further still with its 2004 and 2005 'Entertainment PC' designs, Kessler and Sandow. Based around Intel's 915 and 925X chipsets, such EPCs plan to hide away much of the fiddly functionality of the PC in favour of a CE approach. Intel sees this new generation of PC – wireless enabled, PCI Express compatible and equipped with high-definition audio – being used for the 'consumption of content' rather than 'the creation of content'. Such a digital terminal might even be cheaper as a result.

There's no single vision for tomorrow's PC system. Entertainment servers will prolong the life of bulky tower cases, while MicroATX and the new BTX form factors should see a shift to more compact, slimline PCs. What we can be sure of, is that there will be a wide choice of systems to suit all types of user. There's never been a more exciting time to own a PC. But considering the changes on the way, now may be the worst time to buy one. — **Jerry Donlan**

The Writing on the WAN

Reading is fun, but paper is only one possible medium for it. What happened to the eBook?

I'm a consummate reader. I have shelves and shelves full of books in my bedroom and my study, stuffed to bursting point with everything from light fantasy yarns to in-depth guides to fancy magic tricks. However, I've recently been taking a break from conventional books. After years of Luddite-style squinting at the printed word, I decided to experiment with a borrowed HP iPAQ, a copy of Microsoft Reader, and a stack of downloads from some of the biggest eBook sites on the web. Can you really take your library on the move? Technically yes – but in practice, it's incredible just how poor the experience still is.

Whichever book you choose to buy, chances are good that it's going to be wrapped in hateful Digital Rights Management, which prevents you from copying or printing the book on the grounds that the publisher has a little icon to shackle you with, and nothing is going to get in the way of that power trip. Certainly, I wasn't best pleased to see a stern warning that

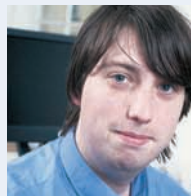
text-to-speech had been disabled before opening my first eBook's virtual cover. I didn't want to use that feature beforehand. Now I do. Out of sheer bloody-minded pique.

Worse, however, was the sight of the actual content. You'd think that it would be the easiest thing in the world to take a lump of text and pour it on to a PDA for people to read – but apparently not. Book after book was presented as a mash of poor formatting – cluttered copyright pages, inappropriate paragraph settings that sliced up the entire screen, and even entire pages wasted on blurry, poorly compressed icons. Bear in mind that I'd paid money for these – about what you'd expect for a paperback that you can lend, sell, trade and even set ablaze in a bad mood.

Keen to find out if this was just a limitation of the Microsoft Reader technology, I zoomed across to Cory Doctorow's **www.craphound.com**, downloading his free book, *Eastern Standard Tribe*, as raw text and manually converting it into Microsoft Reader format. It came out fine. Perfect, even. Five minutes of

Richard Cobbett
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As a public service announcement, Richard would just like to say: "Down with IE! Get Firefox!"



fiddling with settings, and I had an eBook of better than commercial-quality, sitting in the palm of my hand. Bluntly, if I can do this with a free Word plug-in, there's no excuse for any downloaded eBook to come out so misconverted.

The first irony is that a properly put together eBook is very comfortable to read. Modern PDA screens – and by extension, smartphones, laptops and other portable machines – are large enough to display a decent chunk of text. A thousand pages worth of novel really helped a recent train journey to fly by. The second irony, is that it was while hunting for new sources of eBooks, I ran across their mirror-universe opposite – bringing the data back into accessible paper form, courtesy of an excellent service called Lulu (**www.lulu.com**).

Lulu, founded by former RedHat chairman, Bob Young, is easily described: it's a print-on-demand service. Authors upload the details to the main Lulu server, and whenever somebody

orders a copy, the printers are fired up and the book produced. The sample in front of me right now, 'The Devine Hahoo' is around 207 pages, priced at \$12.73 – roughly £7,

excluding P&P – and a decent quality piece of work. Most notably, it's perfect-bound, has a shiny, glossy cover, and is printed on actual paper, not that second-hand loo-roll that so many companies have tried palming off on people. It's a way for authors to actually produce something that feels like a proper paperback book, rather than a quickly thrown-together freebie from the coffee shop.

It's a fascinating business. News companies have been getting increasingly hammered by live feeds and blogs, comic books have come up against regularly updated webcomics, and even butter is at war with **icantbelieveitsnotbutter.com**. With the ease of creating eBooks, print-on-demand outfits like Lulu, and more general services like CafePress finally beginning to prove themselves as genuine business opportunities, we could well be on the verge of another content revolution – driven by the Internet, and lacking an RIAA devil figure to plant itself in the way of progress. If the big companies don't capitalise on the opportunity, someone else will.

"IT SHOULD BE AN EASY THING TO POUR TEXT INTO A PDA – APPARENTLY NOT..."

PREVIEW



The two GeForce 6800 cards here are linked together by a small SLI connector, which you can see at the top.

Nvidia SLI Multi-GPU

Linked GeForce 6800 cards smash the 20,000 3DMark 2003 barrier

After the launch of its next-generation GeForce 6800 graphics card, Nvidia has resurrected its half-forgotten Scalable Link Interface (SLI) technology, to push back the boundaries of 3D graphics even further. Back in 1998, 3Dfx linked its Voodoo 2 boards with an SLI interface, which enabled two of these PCI

cards to be linked together to dramatically boost visual processing performance. Six years later, and with the introduction of PCI Express, the technology has resurfaced as SLI Multi-GPU.

The idea is a simple one. Find a compatible motherboard – one with two adjacent x16 PCI Express connections. Then plug in two PCI

Express-based GeForce 6 or Quadro graphics adaptors and connect these devices together with a small SLI Connector (see picture, left). Embedded communications protocols in the Nvidia GPUs enable the two cards to function as one, scaling-up geometry and fill rate/pixel shader performance accordingly. Nvidia calls it 'symmetric multi-rendering with dynamic load balancing'. In layman's terms, this sees the two cards splitting the workload – one GPU renders the top half of the screen, while the other GPU is dedicated to the bottom half.

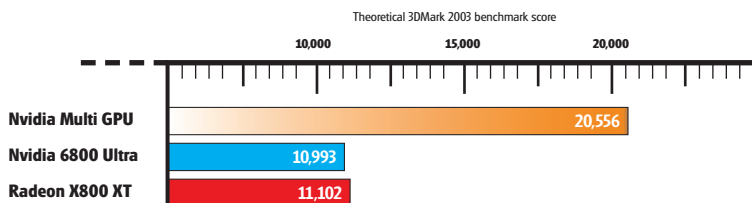
Titanic benchmark scores

No SLI systems are available for review as we write, but Nvidia suggests that a linked GeForce 6800 system should provide a performance increase that's 1.87 times as fast as a single card. Our tests in PC Plus issue 218 rated the GeForce 6800 Ultra with 3DMark 2001SE and 3DMark 2003 scores of 16,587 and 10,993 respectively. A 1.87x increase would propel these scores up to a staggering 31,017 and a breathtaking 20,556. Unofficial reports claim that real test scores are slightly higher – some reports suggest that 3DMark 2003 run-throughs have returned scores close to 22,000.

So, why has nobody done this before? There's a simple answer. The old PCI standard has a maximum throughput of 133MB/s, so while graphics cards could be linked together, there wasn't the bandwidth to take advantage of the increased performance. PCI Express introduces a high-speed serial bus that offers around 60 times the throughput of the old PCI architecture. It's early days, and the cost of two 6800 Ultra or GT cards will limit the penetration of the SLI technology. As we write this, Dabs UK is selling 256MB 6800 Ultras for £370-£400. But just as Intel has realised that the future lies in dual-core chips and parallel processing, perhaps a single-slot dual GPU version is on Nvidia's drawing board.

Find out more about Nvidia's SLI Multi-GPU technology on the Internet by swinging by: www.nvidia.com – **Dean Evans**

Nvidia SLI Multi-GPU vs single GPU PCI Express cards



The potential performance of the SLI Multi-GPU system is stunning and reports suggest that 3DMark scores in excess of 22,000 are possible.

THE MONTH IN NEWS

... According to a recent survey, the number of **mobile phones** in Sweden now exceeds the number of people there. At the last count, the country's population totalled 8.98 million, while cellphone subscriptions have hit a high of 9.07 million. If the figures are correct, phones have 100.1 per cent market penetration...

... Intel's good news: with 1.7, 1.8 and 2GHz **Dothan** chips now rolling out, the chip giant plans to bolster its new 90nm range with low voltage chips for small form factor notebooks. Expect to see a 1.1GHz version of the Pentium M chip in Q3. Intel's bad news: flaws in its 915 and 925X chipsets recently led to a full-scale recall...

... **Correction:** In PC Plus 218, we reviewed the latest version of PKWare's PKZip. Although the details of the review were correct, we unfortunately printed the wrong version number within the heading. The reviewed software was in fact PKZip 8. We apologise for any confusion this may have caused.

An Eastern Eye

High-tech products making a name for themselves in the Far East

Casio/JCB Offica e-money watch (£ N/A)

We've been hearing about electronic cash for almost as long as we've had microchips – both Singapore and Tokyo have seen commuter transportation passes rolled out to much acclaim. For the first time, back in 2001, Japan's Suica train passes allowed for ticket-checking without contact, then, earlier this year, for swipe-and-go shopping in station stores. Now, the credit card giant JCB has teamed up with Casio to trial wristwatches with e-money and ID-card functions. Remember how rapidly USB Flash memory drives became ubiquitous? Well this technology is a lot more compelling, and it will be everywhere before long.



Sony Network Walkman NW-HD1 (£260)

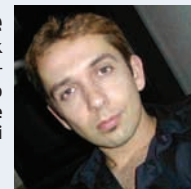
Launched in July, to mark the 25th anniversary of the birth of the original Walkman, the HD1 has already been widely condemned as a failed attempt to compete with Apple's iPod. On the face of it, the HD1 is reasonably well-equipped, with a 20GB HDD and some intuitive controls. But you get that sinking feeling when you realise that Sony has burdened it with its proprietary ATRAC3 format. While other players support more open forms of compressed music, Sony's baby adheres to the company mantra of attempting to force the market to adapt to whatever standard it hopes to impose in the name of copy protection.



J. Mark Lytle

jmark.lytle@futurenet.co.uk

Mark lives in Tokyo
to be closer to the
love of his life – sushi



Fujitsu DynaMO 1300LT photo drive (£130)

Modern multi-megapixel digital cameras mean bigger, better photos, which in turn, means spending more money on large-capacity memory cards. Professional photographers often avoid the problem by carrying portable hard drives, on to which they offload their snaps to free-up their cards. These also tend to be costly, so this alternative from Fujitsu may be worth a look. As it uses relatively cheap Magnetic Optical (MO) disks instead of a hard disk platter, building a back-up library is relatively simple. It also doubles as a removable drive for a PC, and has slots for eight varieties of memory card.



This series	Part One	Part Two	Part Three
Building a fully-working Windows screensaver	Creating and running a simple screensaver	Previewing an animation in the Display Properties dialog	Implementing a configuration dialog for the screensaver

Building C# screensavers

PROJECT TIME



1 HR 30 MINS

SKILL LEVEL



4 INTERMEDIATE
Strong familiarity with C# and .NET is all that's needed

YOU'LL NEED THIS



Visual Studio .NET, C#Builder or another C# development tool, the MS C# compiler, the .NET 1.1 framework

FILES ON SUPERDISC



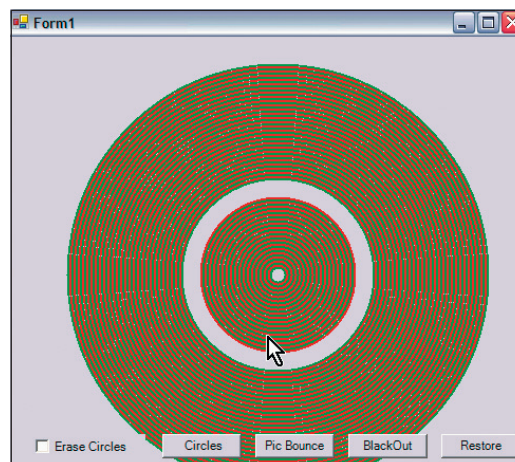
Any files you need to complete this Masterclass are on the SuperDisc

Huw Collingbourne begins a new series on how to create animations that can be run as Windows screensavers

A screensaver application is, to the more advanced programmer, what 'Hello World' is to a beginner. It is something that is almost obligatory to code at some stage – just to prove that you can do it! However, there is a great deal more than mere kudos to this endeavour, and a nice screensaver is more than just Windows dressing. It can also be an effective promotion tool for an individual or a business. But, from our point of view, the real interest in coding a screensaver is that it's a challenge that will introduce us to some of the more interesting features of .NET.

Before we get started, we first need to clarify what a screensaver actually is. In brief, it is an ordinary executable program, just like any other. The main difference is that its extension has been changed from .exe to .scr and it resides in the \System32 directory under your \Windows directory. As long as it adheres to these two rules, a screensaver could, in principle, be any kind of application. There is no fundamental reason why it should not be a word processor, for example, or a calculator. It is probably rather unlikely that you would want a calculator to pop up after a pre-defined interval but, if that is something that appeals to you, you can certainly do it.

At one time, screensavers were vitally useful utilities. In the far-off days of DOS, monochrome CRT monitors often displayed the same image on screen over long periods. This meant that certain screen pixels were 'turned on' more or

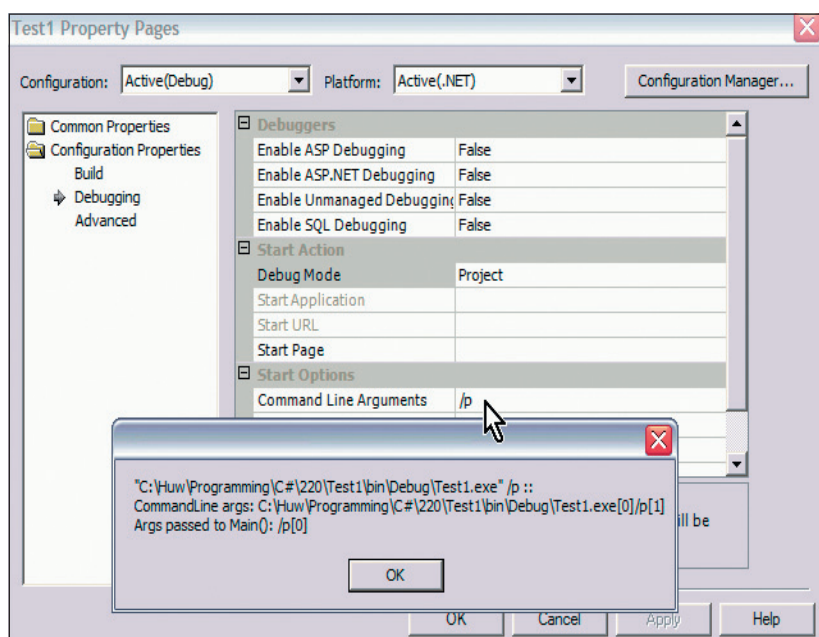


This is the simple animation that we created previously. This month we find out what it takes to transform this standalone application into a screensaver that can be run by Windows.

less continuously, causing a ghost image to be burned into the screen. For example, a faint image of the window frames around a spreadsheet would remain visible on screen even when the spreadsheet itself was closed. Even now, it is quite possible for ghost images to be burned into CRT screens. However, with the advent of better monitors, built-in energy saving which blanks the screen automatically, and thin-screen TFT monitors which don't suffer from pixel burn-in, most people now think of a screensaver more as a form of light entertainment than an essential utility.

Getting argumentative You can select and preview the installed screensavers using the Windows Display Properties dialog. Pop this up by right-clicking the Windows desktop and selecting Properties, then switch to the Screensaver page. Notice the Settings and Previews buttons here. Many screensavers provide configuration dialogs which pop up when the Settings button is clicked. Clicking the Preview button should cause the screensaver to run immediately without having to wait the indicated number of minutes.

When programming a screensaver, you need to ensure that it responds properly to those two buttons. The trick here is to check the command line arguments that the buttons cause to be sent to the screensaver. According to Microsoft's documentation, there are three arguments that can be sent to a screensaver: /c, /p or /s. When you click the Settings button, the /c argument is sent and it is up to your screensaver to respond to this by displaying a configuration dialog if it has one. When the /s argument is sent, the screensaver should run in the full screen. When the /p argument is sent as the first argument, it is followed by a second argument which provides the handle to the Display



When developing a screensaver, you need to test its response to certain command line arguments. In Visual Studio, you can enter arguments into the Project Properties dialog, as shown here.

PCPlus Back Issues

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<http://forum.pcplus.co.uk>

Huw Collingbourne
huw.collingbourne@futurenet.co.uk

Huw Collingbourne likes to spend a few hours every day polishing his algorithms. Sad, huh?

Property dialog's Screensaver Preview window – that is, the little monitor screen on the Screensaver page of the dialog. This can be used to display your animation in miniature, as we shall discover next month.

Before going any further, let's see how to verify the parameters that are sent by the Display Properties dialog. To do this, I have written a 'fake' screensaver whose sole purpose is to display any command line arguments sent to it. You will find the code of this in the Test1.sln solution. There are two techniques that this employs to retrieve arguments. First, it uses the CommandLine property of the Environment class. The Environment class supplies a variety of information on the hardware and software status of your PC. The CommandLine property returns a single string containing the program name and any arguments used to start the current process. We could parse the arguments from CommandLine but there is, in fact, a simpler alternative, since Environment.GetCommandLineArgs() does this for us. We have assigned these arguments to the variable, cl_args:

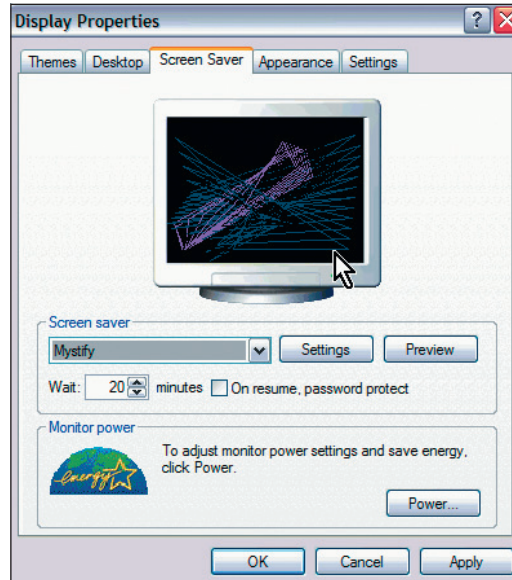
```
string[] cl_args = Environment.  
GetCommandLineArgs();
```

An alternative way to get the arguments is to simply add a string array parameter, args, to the argument list of the Main() function, like this:

```
static void Main(string[] args)
```

Our code iterates through both the CommandLine arguments, cl_args, and the Main() method arguments, args. A message box displays the entire command line, followed by two strings representing the indexed list of cl_args and args.

To use this program, build it as normal, then locate the .exe file in the \Test1\Bin\Debug directory. Copy this to \Windows\System32 and rename it Test1.scr. Now, pop up



Ultimately, we want to be able to display a miniature animation in the small monitor shown in the Display Properties dialog. We will undertake that task in next month's Masterclass.

the Dialog Properties dialog and load the Test1 'screensaver'. When selected, the message box should pop up displaying the command line, which will be something like "C:\Windows\System32\Test1.scr /p 263742", followed on the next line by the Environment class's command line arguments and indices, then by the arguments passed to Main(). The Environment's arguments include the program name at index 0, followed by /p at index 1, and the number identifying the preview window at index 2. The arguments to Main() omit the program name and are indexed 0 and 1 respectively. ➔

PASSING SHOT

Sometimes programmers talk about processes and threads, without giving any thought to what these terms mean. In many cases, a process is synonymous with 'application'. It is a self-contained chunk of memory which holds a program's executable code and data, as well as any other resources it requires. The Process class provides code to start, stop and examine processes. We have created Process objects in code, but you can also select a Process object from the Components palette of the Toolbox.

Every process contains at least one thread. A thread is a bit like a process within a process; it runs code inside a process and multiple threads may run simultaneously. In a word processor, one thread might repaginate a document while another checks its spelling. The .NET framework provides various ways of locking and synchronising threads to ensure that those inside the same process do not interfere with one another and cause unforeseen damage. You won't need to understand multi-threading in any depth to follow the code in this month's Masterclass, however.

Processed with ease

Finding out which applications are running is quite a simple process

A screensaver is not the same as a normal standalone executable, as it doesn't start and run by itself. It is run in a process started by rundll32.exe, in the \Windows\System32 directory. The rundll32.exe program is a utility that enables you to call functions exported by a Dynamic Link Library (DLL). It is traditional for a DLL to have the extension .dll, but not obligatory. Control Panel tools, for example, are DLLs that have the extension .cpl.

If you wanted to change the screensaver to the Mystify animation (ssmyst.scr) from the command line, open a command box (Start, Run, Command) and navigate to the

\Windows\System32 directory. Then enter this command, being sure to use the same case for all characters:

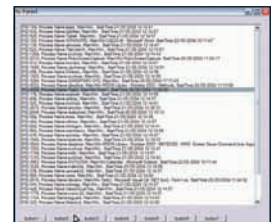
```
rundll32.exe desk.  
cpl,InstallScreensaver  
ssmyst.scr
```

You can display the Display Properties dialog from the command line by entering this:

```
rundll32.exe shell32.  
dll,Control_RunDLL desk.cpl
```

In the months ahead, we will need to find information on other running

processes and, to that end, I have begun to experiment with the .NET Process class in this month's Test2.sln solution. Look at the code of button1_Click(). This initialises an array of processes. It does this using the GetProcessesByName() method of the Process class. This method is passed a string argument, here "notepad", and returns all processes with that name. This means that if you launch Notepad three times, it will fill the array with three Notepad processes. Our code then iterates through the processes, using Process class methods such as Id and ProcessName to find information on each one. ■



The Process class can provide us with much of the same information displayed by the Processes page of the Windows Task Manager.

Starting processes

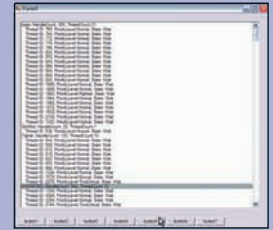
The Process class gives you an easy way to run other applications

In the Test2.sln solution, buttons 1 to 3 provide examples of the type of information you can obtain about the processes running in the Windows environment. Button 4 starts a process; in this case, the 3D Pipes screensaver animation, sspipes.scr, (though it could be any other executable file that you happen to have installed).

To start a process, you must first create an instance of the Process class. Ours is called p. Simply creating the Process object does not create the process itself. That happens when you call the Start() method. First, you need to specify which process to start by assigning a name to the FileName property of p.StartInfo. Here, StartInfo is

a ProcessStartInfo object. This has a number of its own properties and methods, which can be used to do things such as specifying the window style or start directory of the application which runs when the process starts.

Button 5 shows details of each thread, plus how to obtain the number of handles and threads in a process. ■



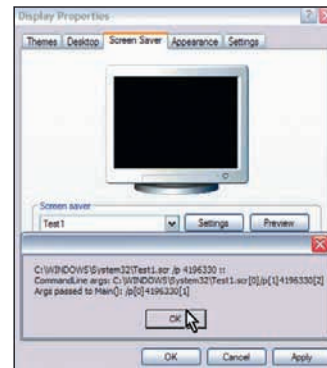
Here we are viewing information on the threads running within each process. Amongst other information, we are showing each thread's priority level.

GOING FURTHER

If you want to continue developing a workable screensaver, you might start by adding a configuration dialog that pops up in response to the /c parameter. In our sample screensaver, this dialog might enable the user to alter the speed of the animation or switch between the circles and the bouncing bitmap. You can also experiment with other types of animation. Take a look at some of the simpler screensavers that come with Windows such as Mystify, Beziers and Starfield. These are simple 2D drawings which can be fairly easily duplicated using .NET drawing features.

Click OK to shut the message box. Now click the Settings button. The first argument is /c followed by a number identifying the parent window, which can be used by the configuration dialog (but which we'll ignore). When you click OK, another message box pops up indicating that the screensaver has been re-invoked, with the /p argument and a handle to the previewing window. This is so we can display our preview here. Click OK to close the message.

Now click the Preview button. This time you will see that the /s argument is sent. This indicates that the screensaver should be run in full-screen mode. Don't confuse the /p argument to 'preview' the screensaver in the mini screen shown in the Display Properties dialog, and the /s argument that is sent (somewhat confusingly) by the Preview button when you want to show the animation in the full screen. Now select a more conventional screensaver before clicking OK to close the Display Properties dialog.



We have compiled our Test1 project, then changed the extension to .scr and placed it into the \Windows\System32 directory. When we come to load it as a screensaver, it displays the CommandLine arguments – this is a useful fact to take note of here.

2 A multi-monitor screensaver Last month we programmed simple animations that could be made to fill entire screens on a PC with one or more monitors. Potentially, this has the makings of a screensaver. All we have to do is handle the arguments to ensure that the screensaver starts up when it is supposed to. Load up the Scrsave.sln solution. This contains an adapted version of last month's project. The key difference is that the Main() method has been provided with a string array argument, args, which we test to see if any of the screensaver arguments are found. If /c or /p are found, we display messages to show that we realise the configuration and preview modes should be used, and we set the Boolean variable, runsaver, to false:

```
if (args[0].ToLower().IndexOf("/c") >= 0)
{
    MessageBox.Show("Config! No options available!");
}
```

```
runsaver = false;
}
else
if (args[0].ToLower().IndexOf("/p") >= 0)
{
    MessageBox.Show("Preview Mode");
    runsaver = false;
}
```

By default, the runsaver variable is true, and remains true if neither the /c nor the /p arguments are found. If runsaver is true, the screensaver is run in full-screen mode. We'll be dealing more fully with the preview and configuration modes in future parts of this Masterclass series.

If you want to try this out, build the project, change the executable extension to .scr, copy it into \Windows\System32 and load it using the Display Properties dialog. Apart from the lack of a miniature preview and a configuration box, this looks pretty much like a normal screensaver, but it does not shut down when you move the mouse. That's another thing we shall need to code in future versions. **PCP**

NEXT MONTH

It is relatively easy to create a full-screen animation for use as a screensaver, but how can we preview a miniature version in the Display Properties dialog? Find out in Part Two next issue.

Sending keystrokes to a window

The SendKeys class enables you to type keystrokes without touching your keyboard



Here we have opened multiple copies of Notepad and inserted two lines of text in each – without touching the keyboard!

If you want to control an application, you can type in the keystrokes or write a program to do it for you. Visual Basic programmers have long had access to SendKeys, which simply squirts keystrokes into the topmost application. This feature has been incorporated into the .NET framework, which means that it is also available to C# programmers.

For an example of using SendKeys, load up the Test2.sln solution and find button6_Click(). This starts up the Windows Notepad using Process.Start() and sends text to it using SendKeys. The SendWait() method sends the keystrokes to the active window and waits for them to be processed. There is

also a Send() method which sends the keystrokes but doesn't wait. We have used the tilde character (~) to send a carriage return; you can send other non-printing characters by inserting codes between curly brackets. For example, {BS} sends a backspace and {TAB} sends a tab. The complete list of codes is documented in the help entry for SendKeys.Send().

Be careful when using SendKeys, as it will send keys to the application that's active at the time. This is why my code first brings the selected window to the foreground using the Win32 SetForegroundWindow() function, which I have imported towards the top of the

unit. I have also inserted a brief pause, using System.Threading.Thread.Sleep(), to make sure the specified window has time to be brought into the foreground.

I have used similar code in button7_Click(). This time, however, each Notepad process is tested using the MainWindowTitle property, to see if the caption of the Notepad window is "Untitled – Notepad". This caption only appears when Notepad contains a new or unsaved document. My code now takes different action, depending on whether or not Notepad contains a named document. It only sends keys to instances of Notepad which do not contain named documents. ■

This series	Part One	Part Two	Part Three	Part Four	Part Five
Internet programming techniques with Managed C++	A gentle introduction to Internet programming	Working with sockets and protocols	The inside story: Doing it with threads	File transfer (HTTP, FTP, etc)	WinInet and other Internet programming techniques

The inside story: Doing it with threads

PROJECT TIME



2 HRS 30 MINS

SKILL LEVEL



5 INTERMEDIATE
Assumes some familiarity with both .NET and Win32 programming

YOU'LL NEED THIS



A .NET compatible C++ development system (E.g. Microsoft VS.NET)

FILES ON SUPERDISC



Any files you need to complete this Masterclass are on the SuperDisc

Dave Jewell explains how to create Internet applications with multi-threading, to provide a responsive user-interface experience

Last month, we spent some time talking about blocking versus non-blocking calls. You'll remember that a blocking (synchronous) call doesn't return to the caller until the I/O operation has completed. This is true whether we're talking about file I/O, sending data over a serial link or communicating over the Internet. The calling thread is effectively frozen until the operation completes and can't do anything else. On the other hand, a non-blocking call (also referred to as an asynchronous call) returns immediately to the caller. The calling code which triggered off the I/O has to either periodically check the progress of the operation, or provide the address of a call-back routine, invoked by the .NET framework library when the I/O completes.

As we said last issue, synchronous (blocking) I/O is much simpler to use, but it does mean that you have to structure your code as a multi-threaded application to avoid the whole thread freezing up. Let's spend a bit of time looking at how multi-threading works under .NET.

1 Creating a new thread in .NET A thread is encapsulated by the (surprise, surprise!) Thread class which is contained within the System.Threading namespace. You create a new thread by instantiating a new instance of this class, as follows:

```
Thread * myThread = new Thread (new ThreadStart
(0, &MyClass::ThreadProc) );
```

There's only one constructor for Thread – it takes a single argument, which is a delegate reference to a method that's called when the thread begins executing. Recall that in the world of .NET, pointers are deprecated. Although C++

supports pointers, many other .NET languages don't, and therefore a delegate is used to encapsulate the address of the thread procedure.

This is done via the ThreadStart delegate. The constructor for this delegate takes a single parameter, the address of the thread procedure. Yeah, we know; it looks as if it takes two parameters, but that's how you create a delegate in C++; if you were doing it in C# or VB.NET, on the other hand, you'd only see the one parameter!

2 Starting the thread The thread procedure is generally organised as a while loop; the thread runs inside this loop while it's executing. A newly created thread doesn't start executing until you call its Start method, like this:

```
myThread->Start(); // kick the
thread off...
```

If the thread procedure exits, then this automatically stops the thread; if it's appropriate to do so, you can run it again with another call to Start. From the above, you'll see that thread handling is really very straightforward under .NET. There are other things that could be mentioned, such as thread priorities, suspending and resuming threads, but they're not so relevant to us here.

Actually we lie. Perhaps things aren't quite as straightforward as one might wish. There's one thorny issue that often rears its ugly head when dealing with multi-threading applications, and that concerns the user-interface. If you're writing a console application which simply spits out messages to a text window, then you've got few problems on your hands. Similarly, if you're writing a faceless server which communicates with multiple clients and has no user-interface of its own, then again, you won't encounter this issue. But if you're creating a WinForms application which uses background threads to talk to a server, you need to tread carefully.

So what are we talking about here? To put it all in somewhat simpler terms, this issue relates to re-entrancy in the WinForms library. Suppose, for example, that the main foreground thread of your application is drawing text on the screen. While this is happening, a background thread comes along and wants to update a progress bar. If the background thread makes a direct call to the relevant WinForms method, you could end up with multiple simultaneous calls into the WinForms library. If the library was written in a re-entrant manner this would be fine, but it isn't; the basic issue is that WinForms controls can only execute on the thread on which they were created.

If you're an experienced VCL developer (Delphi or C++ Builder), you'll know that there's a special Synchronize method of the TThread class which enables a user-interface update to be easily synchronised with the foreground thread. Unfortunately, .NET does not have such a routine, although

Source Code
Interlocking Threads by Mahesh Chand, Sep 10, 2002. Sharing variables among multiple concurrent threads may lead to data inconsistency. To overcome data inconsistency, we usually apply locking mechanism on the shared variables. However, locking may not be the best way in some cases.
Changing the default limit of 25 threads of ThreadPool class by Yash Halje, Jun 19, 2003. The thread pool is created the first time you create an instance of the ThreadPool class.
Use Thread Local Storage to Pass Thread Specific Data by Doug Doodens, Mar 10, 2003. In an ideal world developers typically create instance variables and access these via interfaces to hold thread specific data.
ChessOnline Version 1.0 by Samesh Ahmad, Dec 31, 2002. The attached project is a chess game that can be played by two users online as well as on the network.
Synchronized Threading in .NET by Ahmad Al-Kayali, Dec 11, 2002. Threads are a powerful abstraction for allowing parallelized operations: graphical updates can happen while another thread thread is performing computations; two threads can handle two simultaneous network requests from a single process, and the list goes on. Since threads are pretty simple to understand, conceptually, but, practically, they are a cause for programmatic headaches, I decided to write this program to describe how to make use of threads.
Using the ThreadPool to Run Animated GIFs by Mike Gold, Nov 14, 2002. In this article we will discuss the use of the ThreadPool class in conjunction with the ImageAnimator class to run 2 animated gifs in separate threads.
Sorting using Multithreading by Indika M. W., Nov 13, 2002. This is a simple multithreading application that sort integers values in an array.
Client/Server Multithreaded Application by Indika M. W., Nov 09, 2002. This is a simple Client/Server (multi-threading) program that transfers data. Server can handle multiple clients.
Consumer/Producer Multithreaded Application by Indika M. W., Nov 04, 2002. This is a consumer/producer multi-threading program written in C#.
Drawing Shapes Using Threading by Indika M. W., Oct 25, 2002. This is a simple multithreading program that draws circles and rectangles.
Recipe to Implement Threads Quick & Easy in C# by Erleed Larson, Aug 26, 2002. In this tutorial type article, author shows how to write threading applications quick and easy in C#.

This is part of the multi-threading section of the C# Corner website (www.c-sharpcorner.com). There's a huge amount of thread-related stuff here, including how to change the number of workers in the ThreadPool!



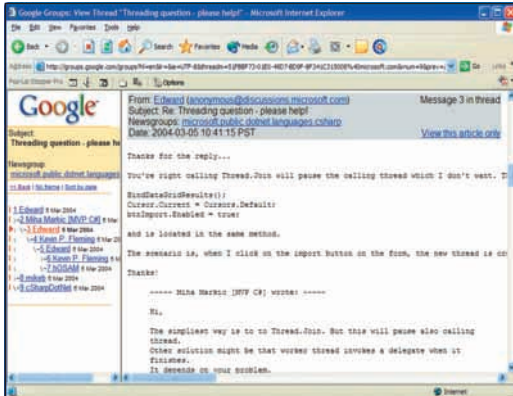
Dave Jewell

djewell@pcpmag.co.uk

Dave is a freelance journalist, consultant and programmer who has worked with Windows since version 1!

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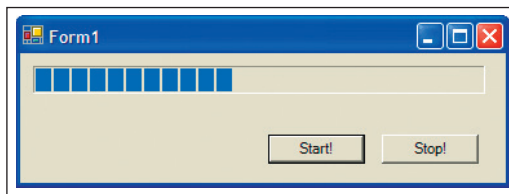
The simplest way of getting your multi-threading questions answered is to browse the various microsoft.public.dotnet.* forums using <http://groups.google.com>.

it's probably possible to add the equivalent functionality by deriving a new class from Thread.

3 Synchronising with the UI thread There are several ways of getting around this problem, all of which are based around the Invoke or BeginInvoke methods. To illustrate one of the most popular approaches, take a look at the source code of this month's ThreadDemo project. This is based on sample code provided by Microsoft, but has been augmented in various ways.

The program simply updates a progress bar using a background thread. The thread is started by clicking the Start button. The event handler for the Start button looks like this:

```
private: System::Void button1_Click(System::Object * sender, System::EventArgs * e)
```



This month's little thread demo simply updates a progress bar in the background. Your homework is to get it to talk to your POP3 server and retrieve the number of unread email messages.

```
{
StopThread();
timerThread = new Thread (new ThreadStart
(this, &Form1::ThreadProc));
timerThread->IsBackground = true;
progressBar1->Value = 0;
timerThread->Start();
}
```

The StopMethod call simply calls the Interrupt method of the thread's instance variable in order to kill the thread (see the 'Killing threads programmatically' box on page 200), and then sets the instance variable to null. A new thread is then initialised as described earlier, specifying the ThreadProc routine as the thread procedure.

You'll also notice that the IsBackground property of the thread is set to true – this is something we haven't mentioned until now. The significance of this, is that all newly created threads are foreground threads unless specifically marked otherwise. When you try to close an application, the .NET runtime won't allow the app to leave if it has active foreground threads. On the other hand, any active background threads are automatically killed by

VITAL READING

If you're eager to explore Internet programming techniques in depth, we'd recommend a book called 'TCP/IP Sockets in C#: Practical Guide for Programmers' by David Makofske, Michael Donahoo and Kenneth Calvert. It's a treasure trove of wisdom on many aspects of Internet programming within the context of Microsoft's .NET class frameworks. As the title suggests, the book is written from the perspective of C# developers, but astute C++ programmers will have little trouble in translating the code for their own use. If you have problems with a specific method call, just search for it on www.google.com, specifying that you want to scan the microsoft.public.dotnet.* groups).

You can order 'TCP/IP Sockets in C#: Practical Guide for Programmers' from www.amazon.co.uk for £12.99. Quote the ISBN number 0124660517 when searching for it, as there are other titles from the same publisher with a similar name. Find out more at www.mkp.com/practical/csharpsockets. To download all the book's source code, click the link for 'Companion Site'.

Using the ThreadPool

How to avoid performance issues in heavily-threaded application development

Threads are a cool way of building an application that remains responsive while silently using blocking I/O in the background. However, as with most things, there is a downside. There's a significant operating system overhead each time a new thread is created, and if you're writing a server application, for example, and it services hundreds of clients, overheads can become unacceptable as more and more threads join the fray.

One solution to this problem is the ThreadPool, another specialised class that's defined in the System.Threading namespace. You can think of the thread pool as a group of workmen, each eager

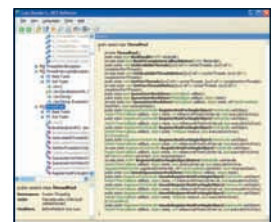
to do your bidding! The ThreadPool class is simply there, waiting for you to use it. Don't try to instantiate this class; if you do, a NotSupportedException will be raised. You access the ThreadPool by using the various static methods and properties that are provided. For example, you can find out how many workers are idle by calling GetAvailableThreads. The GetMaxThreads property retrieves the total number of workers in the pool.

To put a work item into the ThreadPool, you simply use the QueueUserWorkItem routine defined here. It's pretty similar to the Thread constructor, in the sense that it takes

a delegate representing the thread procedure – the work that needs doing:

```
public: static bool
QueueUserWorkItem
(WaitCallback * callback);
```

When you call QueueUserWorkItem, a worker thread will be assigned to the task if there's an idle worker available. If not, the work is queued. Each time a worker thread finishes a task and becomes free, the next available work item is assigned to the worker. Be sure to include System.Threading in your project before making use of the ThreadPool. ■



The ThreadPool class defined in System.Threading provides a straightforward mechanism for performing background tasks, without you having to explicitly create new thread instances.

Killing threads programmatically

How to slay your background threads without making a big mess

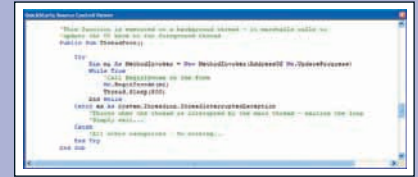
A thread will stop naturally when the thread procedure (referenced by the delegate passed to the Thread constructor) terminates. However, because many thread procedures are written as infinite loops, you may need to tell the thread to die. For example, if the user clicks the close box of your application window, you need to ensure

that each background thread is closed in an orderly fashion.

One useful method for achieving this is to call the thread's Interrupt method. This will raise an exception (of the type ThreadInterruptedException) within the thread procedure. If you structure your thread procedure appropriately, you'll notice that it causes the procedure to

jump out of the loop and terminate naturally.

One warning before you try this method. Be sure to use a try-catch block to catch the exception and silently 'eat' it before exiting from the thread procedure. If you don't do this, you'll get an unhandled exception error somewhere else. ■



This VB.NET code snippet, taken from one of Microsoft's samples, shows how to structure a thread procedure in such a way that it silently eats a thread-interrupted exception and exits.

GOING FURTHER

When using threads extensively in a complex application, you'll almost always want each thread to have its own data variables. Ideally, these variables should be arranged as locals within the thread procedure. However, as an application gets more complex, passing these around as arguments to all your per-thread routines becomes cumbersome. What's needed is something like a pseudo-variable, but allocated on a per-thread basis. To see how to do this, check out the following link which explains the TLS (Thread-Local Storage) facilities provided by .NET: www.csharphelp.com/archives2/archive447.html.

NEXT MONTH

Next month, we'll be looking at the inner workings of file transfer techniques such as HTTP and FTP. Ever wanted to write your own FTP client or server? We show you how to get started.

the .NET runtime. This means you shouldn't need to explicitly kill background threads before your program closes. Even so, it's a good habit to get into in case there's specific clean-up code you want to execute. Once this has been done, the thread is started. The ThreadProc routine is shown below:

```
private: void ThreadProc()
{
    try
    {
        MethodInvoker * mi = new MethodInvoker
        (this, Form1::UpdateProgress);
        while (1)
        {
            // Call BeginInvoke on the form
            this->BeginInvoke (mi);
            Thread::Sleep (250);
        }
    }
    catch (Exception * e)
    {
        // Exit
    }
}
```

What's new here is the use of the MethodInvoker class. This is a simple delegate that's used to invoke methods that take no arguments. When the thread starts executing, it initialises the MethodInvoker object to 'point to' the UpdateProgress method of the form class. Later, within the while loop, this object is used to call UpdateProgress, go to sleep for 250 milliseconds, call UpdateProgress again, and so on.

The obvious question is why on earth don't we just call UpdateProgress directly instead of fooling around with

MethodInvoker and BeginInvoke? The call to BeginInvoke causes the UpdateProgress method to be invoked within the context of the original thread which created the form. In this way, re-entrancy problems are avoided.

If you're especially on the ball, you might be thinking, 'Okay, but where's the corresponding call to EndInvoke?' You may remember that last month we discussed asynchronous I/O calls; theoretically, every call to BeginInvoke should be matched by a corresponding call to EndInvoke. Well, yes, in theory. In practice, none of the resident Microsoft experts advocate doing so in this type of situation.

It's worth remembering, though, that BeginInvoke is an asynchronous call; it returns immediately without blocking the calling thread. Effectively, you can think of the request to update the progress bar as being queued. If this bothers you, or you don't like the idea of BeginInvoke without EndInvoke, you can always use Invoke instead, like this:

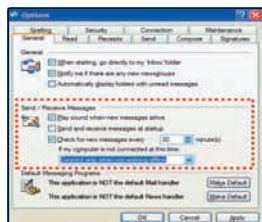
```
this->Invoke (mi);
```

Because Invoke is synchronous, it will block the calling thread until the progress bar has been updated. However, since it's only the background thread that blocks, this isn't likely to be a problem. Bear in mind that the whole point of the exercise is to prevent the foreground thread from blocking, which would compromise the responsiveness of the user interface.

Finally, you'll notice that the ThreadProc method shown above uses a try-catch block to field any exceptions that are raised. This is because threads are typically killed by calling the Interrupt method on the thread instance, causing an exception to be raised in the thread procedure. In this particular case, the catch block will silently absorb any exception (since all exceptions derive from the Exception class), but if you wanted to, you could provide more fine-grained exception handling. **PCP**

An exercise for the reader!

It's time for you to write a non-blocking program to retrieve email in-tray status



Outlook Express provides a set of facilities for playing sounds when messages arrive, polling the server at regular intervals, and so on. All this can (and should) be done through a background thread.

We've talked a lot about threading issues, but relatively little about Internet programming specifics. It's important to lay this groundwork before moving on to more challenging tasks. Here's an assignment which, though challenging, should be well within your capabilities if you've absorbed everything we've discussed until now.

Go to the C* Corner website at www.c-sharpcorner.com/internet/Pop3Access.asp. This page contains the source code for a custom class called POP, which retrieves the status of your POP3 in-tray. It has a property, GetNumberOfNewMessages, which does exactly what it says on the tin: it

returns the number of new, unread messages waiting on your email server. The existing code works by connecting to your email server, specifying the server name, user name and password in the constructor of the POP class. Whenever you retrieve the value of the GetNumberOfNewMessages property, code connects to the server and issues the POP3 STAT command to get the number of waiting messages.

Because this code is written synchronously (all calls are blocking), it's an ideal candidate for placing into a background thread. Using the Sleep method we looked at earlier, you could write the program so as to connect to

your email server once every five minutes to check for messages, maybe playing a tune or beeping if you have messages waiting. If you detect new messages and want to update the user interface, be sure to use either the BeginInvoke or Invoke techniques to prevent re-entrancy problems with the foreground thread.

If you examine the code as it stands, you'll see that there are various diagnostic calls to the Console, displaying server responses as they're retrieved; these can easily be removed. You'll also have to convert the code into managed C++, but hey – we can't make life too easy for you! ■

This series	Part One	Part Two	Part Three
A Delphi Screen Capture Utility	Capturing a picture of the entire screen or a selected window	Capturing a rectangular area, including the mouse pointer	Adding the finishing touches and saving screen grabs to disk

Capture your desktop

PROJECT TIME



2 HRS 00 MINS

SKILL LEVEL



6 INTERMEDIATE
Not as difficult as you might think!

YOU'LL NEED THIS



Quite a bit of API trickery involved this month! You will need Delphi 7

FILES ON SUPERDISC



Any files you need to complete this Masterclass are on this month's SuperDisc

Huw Collingbourne starts work on a screen-capture application, which can take pictures of your desktop or a selected window

There are many times when you may need to take a picture of something on your computer's screen. For example, if you are writing a software manual or creating an interactive tutorial, you may want to add illustrations to show the software in action. Alternatively, you may just need to quickly grab a picture of a digital photograph to email to a friend or put into a web page. This month we begin a new series which shows you how to capture your desktop so that you can undertake all these tasks. Read on and discover how simple it is to take a picture of an entire screen, or a specific window, using Delphi.

There are many ways of grabbing pictures from the screen. Ultimately all of them require functions provided by the Windows API. This reliance on the API may not always be obvious, because Delphi also provides functions that 'wrap up' API calls, thereby effectively hiding them from the programmer, as we shall see.

Load the ScreenGrab1.dpr project. Notice that we have placed a TImage control, image1, onto the form. This will provide the target bitmap in which to display the screen grab. Let's begin with a fairly simple way of grabbing a picture of the entire screen and saving it as a bitmap; this is what happens when you click the 'BitBlt Screen' button. It simply calls GrabScreen(), passing the bitmap from image1 to it. The GrabScreen() procedure assigns a picture of the screen to the bitmap. Image1 is then resized to match the height and width of that bitmap.

1 A simple way to grab a screen Let's see how the screen grabbing itself is done. Scroll up the code to find the GrabScreen() procedure. As you will see, this contains just a few lines of code. First it calls the API function, GetDesktopWindow(), passes its return value to another API

function, GetWindowDC(), and assigns the result to a handle, hdcSrc. Here, GetDesktopWindow() returns a handle to the Windows desktop which covers the entire screen; GetWindowDC() returns the handle of the 'device context' for the Windows desktop. A device context is a graphics structure, which contains information on the display of text and graphics on a particular device. After this single line of code executes, the hdcSrc variable provides a handle (a special Windows-maintained reference number) to the graphics display of the entire screen.

Before we assign a picture of the screen to the bitmap, bm, we resize the bitmap to match the size of the screen itself. The Width and Height properties of Delphi's Screen variable provide us with the necessary size information. Finally, we call the API's BitBlt() function to copy a picture of the screen into the bitmap, bm:

```
BitBlt(bm.Canvas.Handle, 0, 0, bm.Width, bm.Height,
hdcSrc, 0, 0, SRCCOPY);
```

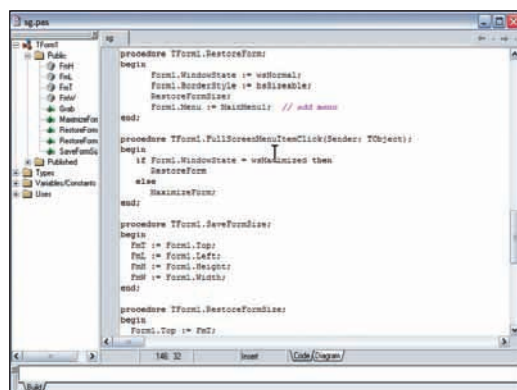
In order to understand what is going on here, we need to examine BitBlt() in some detail. In brief, BitBlt() copies an image (strictly speaking, it performs a 'bit block transfer'), contained within a source rectangle to a target device context. The first parameter here, bm.Canvas.Handle, is the handle of the destination device context. In other words, the bitmap, bm, is our target and it will receive the picture. The next two parameters are the X and Y co-ordinates defining the upper-left corner of the target. We want our bitmap to be completely filled so that its X and Y co-ordinates are both 0. Then come two co-ordinates defining the bottom-right of the target. These are given by the width and height properties of the bitmap.

Next comes the handle to the source device context. We have initialised the variable, hdcSrc to the handle of the desktop window's device context. The next two parameters specify the source rectangle's upper-left corner and once again these are 0. The final parameter is a predefined constant which specifies the operation we want to perform. The SRCCOPY constant instructs BitBlt() to copy the source rectangle to the destination rectangle. Other constants are explained in the Windows SDK help entry for BitBlt().

2 An alternative method

Now, while the BitBlt() method of screen grabbing is pretty simple and easy to perform, it may take you some time to wade through the SDK help and figure out what all those API functions and parameters do. But there are alternative ways of grabbing a screen, and the next one we're going to outline is using the CopyRect() method of Delphi's TCanvas class.

We have implemented this second technique in the GrabDesktop() method, which executes when you click the 'CopyRect Screen' button. The GrabDesktop() method creates a canvas, c, and sets its handle to the DesktopWindow's



We've provided an option to expand a screen capture to the size of the full screen. We have had to save the co-ordinates so that the form size can be subsequently restored.

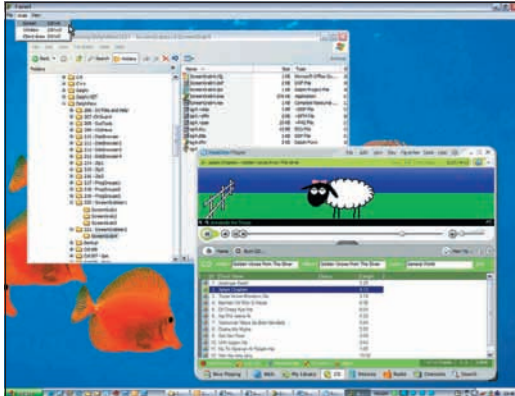

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Huw Collingbourne is author of the book 'Madonna – a Summer Breeze' which, to his astonishment, sells for decent money on eBay

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Here we have used our screen-capture program to make a copy of the entire screen. This can be done either using the menu or by pressing the [Ctrl]+[S] keyboard shortcut.



Our program also enables you to capture a specific window after a five-second pause, during which you can pick a window. Here we have grabbed a picture of the RealPlayer window.

device context. A THandle variable, h, is assigned a handle to the desktop window and the GetWindowRect() function initialises the TRect structure, SourceRect, with the desktop window co-ordinates:

```
c := TCanvas.Create;
c.Handle := GetWindowDC(GetDesktopWindow);
h := GetDesktopWindow;
if h <> 0 then
  GetWindowRect(h, SourceRect);
```

Both the bitmap and a destination rectangle, DestRect, are resized to the dimensions of the screen. The image copying process is then performed by the CopyRect() method of the bitmap's canvas:

```
bm.Canvas.CopyRect(DestRect, c, SourceRect);
```

This stage of the process simply copies the graphics from the SourceRect rectangle on the Canvas object, c, which defines the desktop to the destination rectangle, DestRect, on the bitmap canvas, bm.Canvas.

Finally, to complete this method we need to release the Device Context, c.Handle, which we assigned earlier with GetWindowDC(), and also free the Canvas object, c.

This may look very different from the BitBlt() method of screen grabbing that we used earlier, but under the surface, it is in fact quite similar. It turns out that Delphi's CopyRect() method makes use of an API function called StretchBlt(). This is essentially the same as BitBlt(), apart from the fact that it has two extra parameters for the width and height of the source rectangle. If the width and height of the source rectangle differ from the width and height of the destination rectangle, the bitmap will be stretched or compressed to fit. As we don't need to do this when copying the

PASSING SHOT

When the form is maximised in the ScreenGrab3.dpr project, there is no menu available (it has been set to nil) and no associated shortcuts. This leaves us with the problem of finding some way of responding to a keystroke in order to restore the form to its previous size and style, and give it its menu back. We do this by setting form's KeyPreview property to True so that it receives key events, even if they occur within some other control such as image1. Now, after a keystroke has occurred, TForm1.KeyUp() executes. Here we test if the key with the numerical value 27 was pressed. This is the [Esc] key. If it was and the form is currently maximised, we call the RestoreForm() method. This restores the default window state and border style. It calls RestoreFormSize() to size and position the form using co-ordinates saved earlier. Finally, it reassigns MenuMenu1 to its menu property. The user can press [Shift]+[Ctrl]+[F] to make the form occupy the entire screen, and can press [Esc] to restore the form to its normal size, position and style.

An all-purpose screen-grabber

Now let's rewrite that code so it can handle all types of grabs

In the project ScreenGrab1.dpr, we have treated each type of screen capture as a 'special case' which has its own specific method. I would prefer to have more generic screen-capture methods where possible, and have begun work on this in the ScreenGrab2.dpr project.

This time, you will see that I have written a single method, TForm1.Grab() to capture either the desktop or the active window. In order to control the type of operation, this procedure takes a second argument, gt, which is of the type, GrabType. I have defined GrabType earlier in the unit as an enumerated type comprising two constants, GTSCREEN and GTWINDOW. When

Grab() receives the GTSCREEN constant it calls GetForegroundWindow() to initialise the handle, h, otherwise it calls the GetDesktopWindow() function. This is all that is needed to switch between screen and window grabbing. You might want to let the user to grab specific areas on the screen or the client area (minus the caption bar and frame) of a window. Grabbing the client area is easy, and the API function you need is Windows.GetClientRect(). Be sure to qualify GetClientRect() with Windows as indicated, as Delphi also has another implementation of GetClientRect() which differs from the Windows API function. You should

initialise the handle, hdcSrc using GetDC() rather than GetWindowDC():

```
hdcSrc := GetDC(h);
Windows.GetClientRect
(h, SourceRect);
```

You will need to add a third constant, GTCLIENT to the GrabType type. Having done that you can rewrite the code of the Grab() method.

Compare your solution with that in the ScreenGrab3.dpr project, and see 'Capturing the client area' overleaf for an explanation of the code. ■

```
StretchBlt(bm.Canvas.Handle, 0, 0, bm.Width,
bm.Height, hdcSrc,
0, 0, SourceRect.Right - SourceRect.Left,
SourceRect.Bottom - SourceRect.Top,
SRCCOPY)
```

You need to take care when defining the values of the parameters passed to the StretchBlt() function.

Viewing the full screen

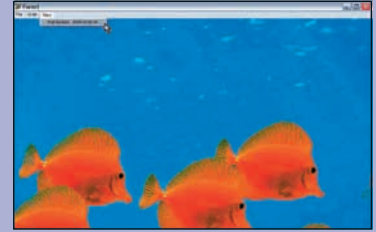
Once you've grabbed a screen, you may want to view it at full size

Having grabbed an image from the screen, it's useful to view it away from the constraints of the screen-capture application's form. A simple (though, as we shall discover next month, not necessarily the best) way of doing this is to maximise the form. In the ScreenGrab3.dpr project, we do this in the MaximizeForm() method by setting

the form's WindowState property to wsMaximized. We also remove the form's border by setting its BorderStyle property to bsNone. Finally, we hide the menu by setting its Menu property to nil.

Notice that before we do any of this, we save the form's size by setting four variables in the SaveFormSize() method. The user can maximise the form using

an item from the View menu or the [Shift]+[Ctrl]+[F] shortcut. There is no menu item to restore the maximised form, for the simple reason that when in the maximised state, the form has no menu. Instead, we restore the form when the user presses [Esc]. Refer to 'Passing Shot' on page 193 for more information. ■



Use the View menu to maximize the window, and remove the menu to expand the picture so it occupies the screen.

GOING FURTHER

There are plenty more things that can be done to improve our screen-capture application. In all probability, you will want to save your screen grabs to disk. Maybe you'd like to be able to mark off a specific portion of the screen and capture that rectangle alone. You might even want to add some simple image-processing features, say to magnify or crop the grabbed image. Some of these features are easy to add, others are more complex. Next month we shall find out how to perform one of the less straightforward tasks – namely grabbing a rectangular portion of the screen.

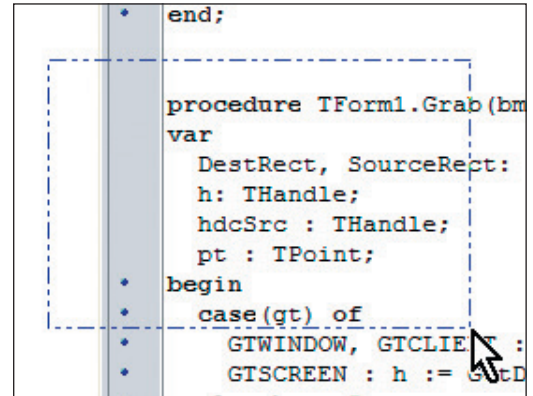
desktop image, we could use either BitBlt() or StretchBlt() to perform the same operation as CopyRect(). We have included the code needed to do this. To try it, comment out the line that calls bm.Canvas.CopyRect() and uncomment one of the two alternative code blocks where indicated.

How to grab the active window

It doesn't take too much effort to adapt the above techniques to capture a specific window rather than the entire desktop. The 'CopyRect Window' button calls our GrabActiveWindow() method to capture a picture of the currently selected window with the help of Delphi's CopyRect() method. The code here is broadly similar to that in our GrabDesktop() method, the main difference being that we call the API's GetForegroundWindow() function rather than GetDesktopWindow() in order to return a handle to the window which supplies our source rectangle. We also have to do a little more work in order to calculate the width and height of the destination rectangle and bitmap. This is because the co-ordinates returned by the API functions are relative to the desktop, and we need them to be relative to the specific window being captured.

An alternative way of grabbing the active window is shown in GrabActiveWindow_Alt(). Instead of using the CopyRect() method of a Delphi Canvas, this goes straight to the API, using the StretchBlt() method which we mentioned earlier. To give the user time to find a specific window, the Click event handlers for both the 'CopyRect Window' and 'StretchBlt Window' buttons hide the application's main form and wait a few seconds before grabbing a window. The GrabScreen() method can also be invoked by double-clicking the main form. In this case, the form is not hidden and you are given five seconds to arrange windows on the screen prior to the capture.

Having experimented with these alternative ways of grabbing windows and screens, we need to simplify the



Commercial screen-capture programs generally let you select an area of the screen by drawing a rectangle using the mouse. We shall be adding this feature to our program next month.

code by writing a more generic screen-capture method. I have made a first attempt at this in the ScreenGrab2.dpr project. Here I have coded one method, named Grab(), which captures either the screen or the active window. You can find a detailed explanation of this code in the box on the previous page called 'An all-purpose screen-grabber'.

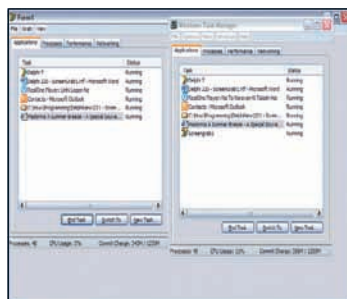
We shall continue to develop this very basic application in next month's Delphi Masterclass Extra. Discover how to add additional features to enhance the screen-capture process, and how to give more control to the user over the precise part of a window being captured. We shall also add the ability to grab the mouse pointer which, in this month's projects, is not captured. In the third and final part of this series, we shall go on to develop this application further still, creating a genuinely useful screen-grabbing tool that can grab, scale and save images to disk. **PCP**

NEXT MONTH

In next month's column we will explain how to select and grab a rectangular area on screen with or without the mouse cursor.

Capturing the client area

Selecting the contents of a window takes a bit of special coding



On the left is our grab of the 'client area' (minus the frame and caption) of the Windows Task Manager.

There may be times when you want to take a picture of the contents of a window but not the window frame and caption bar. The contents of a window are found in the 'client' area and there is a special API call, GetClientRect(), which returns the co-ordinates of a client area.

Load the ScreenGrab3.dpr project and find the Grab() method. When we want to grab the client area of the active

window, we pass to this method the constant, GTCLIENT. First we get the handle of the foreground window using GetForegroundWindow(). Then we get

the handle to the device context using GetDC() which, unlike GetWindowDC(), returns a handle to just the client area, rather than the entire window. To obtain the dimensions of the client area, we call Windows.GetClientRect(), passing the handle to the foreground window as the first argument and a TRect structure, SourceRect, as the second argument. Note that it is important to qualify GetClientRect() with the Windows identifier in order to call the API function of this name, as Delphi defines a different GetClientRect() method.

Finally, when we call StretchBlt() to handle a client area, we must pass different argument values to it than

when handling the screen or a full window. As you can see in our code, the first six arguments are identical in both cases. These define the destination device context, bm.Canvas.Handle, the co-ordinates of the destination rectangle and the source device context. The next four arguments define the source rectangle. These begin with 0,0 at the top-left. The right edge is calculated by subtracting the right-hand edge of the source rectangle from the value of its left-hand edge. The bottom is calculated by subtracting the bottom-edge co-ordinate from the top. This provides us with a generic way of calculating dimensions that we can use again. ■

This series	Part One	Part Two	Part Three
Image processing	Simple images	Tweaking images	Transforming images

Simple image handling

PROJECT TIME



1 HR 00 MINS

SKILL LEVEL



3 BEGINNER
Experience required

YOU'LL NEED THIS



Windows 2000/Windows XP, Visual Studio .NET 2003

FILES ON SUPERDISC



Any files you need to complete this Masterclass are on this month's SuperDisc

The first step in image processing is to get one into your program. Dermot Hogan demonstrates how to slot a bitmap into memory

We've moved on since the original IBM PC introduced graphics. Screens routinely offer over a million pixels, with millions of colours and old glass tubes are thankfully on their way out. But the idea of the 'bitmap' – a one to one correspondence between the image in the PC's memory and what you see on the screen – has remained with us from the start.

When the IBM PCs first came out, unlike with the existing 'glass teletype' screens attached to mini computers, it was possible to draw pictures. It seems strange now, but this was revolutionary at the time. They weren't very good pictures – low resolution and in monochrome – but still a whole lot better than merely being able to say 'hello world'. The reason you could do this was that the PC's screen was 'memory mapped'. That is, behind every point or pixel on the screen there was a bit (that's right, a whole single solitary bit) of memory.

Now, of course, each pixel has 24 or more bits behind it, so with a megapixel screen, a bitmap will be three or more megabytes. Worse, even common digital cameras have eight megapixels giving 24 megabyte raw images. That's before you get into the high-end professional stuff. With 100GB disks, 24MB images aren't a problem. But they are on a camera with a mere 128MB of flash memory to hold your holiday snaps.

Fortunately, this problem has been more-or-less solved for some time. It turns out that bitmaps are very inefficient in storing image data. Heroically so, in fact. For example, if you look at a patch of blue sky. It's all pretty much the same colour and so you might have several thousand pixels with exactly the same value or differing only slightly. In the corresponding bitmap, you then might have several KB 'runs' with each byte having the same value (200, say).

The way round this is to compress the data. The simplest way is to use 'run-length encoding'. So in our example, instead of 10KB of the same value, 200 we might have an

integer giving the length of the run or sequence with the same value and then the value itself. In practice, even this turns out to be a pretty inefficient method and there are much better ways of doing the job. These techniques boil down into two types of encoding scheme, 'lossless' and 'lossy'. With a lossless encoding scheme, like run length encoding, or another format, GIF you can compress and decompress the image as much as you like without losing any image quality.

On the other hand, if you do the same with a JPEG image, you'll soon begin to notice the degradation in image quality, since on each compression and decompression some data is lost in the process.

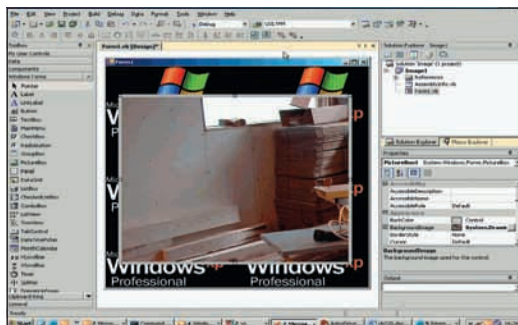
There are other compression formats besides GIF and JPEG. The most important ones are TIFF and PNG, though there are others used for specialised purposes. Interestingly, there have been a few, probably scam, attempts with products designed to compress random numbers. Random number compression systems have a close similarity to perpetual motion machines.

So how do we deal with images in Visual Basic? The easiest way to display an image is to use a PictureBox control and set the Image property. The trouble is that you can't do very much with an image once it's in the control. A better way is to load the image into a BitMap object and then use a Graphic surface's DrawImage method in the Paint event. However, this isn't quite as simple as it might seem.

Suppose we want to load and display a simple bitmap. There's no compression or other shenanigans to deal with and so we might try a simple technique. Here's the code:

```
bm = New Bitmap("winnt.bmp") pbl.Size = bm.Size
```

and the Paint event handler is this:



It's very easy to load an image into any control with a graphics surface. Just set the Image or BackgroundImage property. It's not a very flexible way of doing it though.



This is my first attempt at trying to get an image displayed. The lower PictureBox shows what happens if you don't invalidate the control. Only part of the image is drawn due to the Resize event.

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<http://forum.pcplus.co.uk>
**Dermot Hogan**
dermot.hogan@futurenet.co.uk

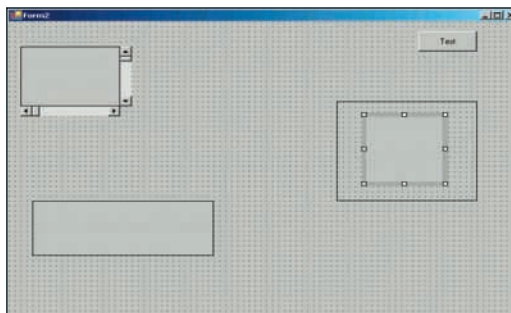
Dermot Hogan has been programming in more languages than he cares to remember, for more years than he can remember

```
If bm Is Nothing Then Returne.Graphics.  
rawImage(bm, 0, 0)
```

The idea of the code here is just to load the bitmap image and display it. But this won't give an image nicely displayed as you might expect. There are two problems: Firstly, you will only get part of the bitmap displayed and secondly, until you refresh the display in some way (minimise and then restore, for example) you will get a grey background in part of the image.

The first problem lies with what a bitmap inherently is and does in Windows. You might think that a bitmap is just a collection of pixel values. Yes, that would be the correct assumption, but in Windows a bitmap also remembers on what device it was created so that it can reproduce the exact size of the original image. The problem is that while the 'size' of the bitmap as reported by the Size method, does indeed reflect the actual number of pixels in the bitmap, the DrawImage method actually draws the 'logical' size of the image, which will take account of the internal resolution of the bitmap.

Now this seems to me to be just plain wrong, but I'm not Microsoft. I'm not rich beyond the dreams of Croesus, either, so maybe there's something to be said for Microsoft's approach. Anyway, the upshot is that with a simple bitmap, you have to fool around with both the 'resolution' of the bitmap and the resolution of the surface that it's being drawn onto before it will display nicely:



The easy way to scroll an image in control is to drop a PictureBox into a Panel and set the Panel's AutoScroll property to True.

```
Dim g As Graphics  
Dim hr, hv As Single  
Dim s As New Size  
g = pb2.CreateGraphics  
hr = bm.HorizontalResolution  
hv = bm.VerticalResolution  
s.Height = bm.Height / hv * g.DpiY  
s.Width = bm.Width / hr * g.DpiX  
pb2.Size = s
```

Here, I've obtained the graphics surface of a second PictureBox, pb2, and then got the horizontal and vertical resolution of the bitmap. Finally, from them, I've acquired the required size of the PictureBox.

PASSING SHOT

As pessimists tend to point out, death and taxes are the only certainties in life. I'd also like to add hard disk failure.

Recently it happened to my laptop. I'd done a full backup, so I simply installed a new disk. To get a backup restored, you have to install a new OS. Tedious, but necessary. So the backup (Microsoft Backup including the system state) was restored and after five hours, the big moment: reboot! It failed. For some reason, Backup didn't restore the registry: it was empty. No message, it just didn't do it. Further ferreting revealed a copy of the registry which I managed to restore (if you think MS-DOS is primitive, try the XP Recovery Console).

Finally, after an hour or so, my laptop sprang back into life. But my point is that hard disk failures happen, dammit! How on earth is the average punter supposed to deal with them – become a Microsoft Certified Engineer?

Scrolling the hard way

If you want a simple scrollable image, look away now

Adding scrollbars to a Panel control (or any other container control) isn't too difficult. Just drop them on and away you go. You can make the code handling a bit simpler by getting the same event handler to deal with both the horizontal and vertical Scroll events:

```
Sub Scroll(...) Handles vsb.  
Scroll, hsb.Scroll
```

The problem comes when trying to do the arithmetic required by DrawImage. The DrawImage method exists in a number of overloaded forms. The one used here takes a destination rectangle and a source rectangle. The destination specifies the location and size of the drawn image while the source rectangle is just a slice out of the original bitmap. First, we have to set up the scroll bar maximum values. These allow you to shift the image by the difference between the original

image size and the destination size allowing for the width of the scroll bars.

```
hsb.Maximum = s.Width - (p2.  
Width - vsb.Width)  
vsb.Maximum = s.Height - (p2.  
Height - hsb.Height)
```

Here's the code I tried first of all:

```
x = p2.Width - vsb.Width  
y = p2.Height - hsb.Height  
dst = New Rectangle(0, 0, x, y)  
src = New Rectangle(hsb.Value,  
vsb.Value, hsb.Value + x,  
vsb.Value + y)  
g.DrawImage(bm, dst,  
src, GraphicsUnit.Pixel)
```

The destination rectangle is the size of the panel, again less the width of the scroll bars and the source portion of the image. However, this doesn't do what

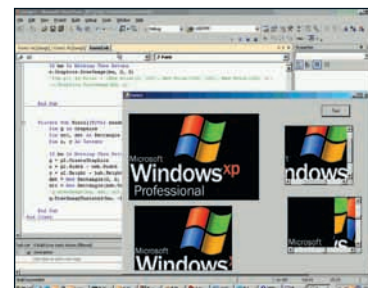
we want. In fact, it reduces (or magnifies) the image! From the documentation of DrawImage it would seem that if the source and destination rectangles are the same size, then no scaling should occur. But it clearly does.

DrawImage does more than shift images around: you can rotate them, flip them and distort them, but I could not get it to do a simple copy.

The real solution, it seems, is to use another method, DrawImageUnscaled like this:

```
g.DrawImageUnscaled(bm, -  
hsb.Value, -vsb.Value)
```

I finally got the scrolling to work. The trick is to use the DrawImageUnscaled method, but it's more work than the first method of dropping a PictureBox into a Panel with AutoScroll on. Slower, too. ■



It can be tricky to put your finger on scroll controls, but not impossibly so.

LZW and the lawyers

Burn your GIFs – the future is now!

By the time you read this, the algorithm used to produce GIF files – LZW – will be patent free. So we can all do legally what we've been doing, possibly illegally, for years! The villain of the piece in this case isn't big, bad Microsoft but Unisys (actually Sperry) who filed for the patent in 1985. The problem isn't so much there being a patent on the

algorithm, but that Unisys didn't try to enforce – or even publicise – its patent until December 1994.

Suddenly, anyone swapping gifs and a large part of the nascent World Wide Web found that they might be breaking the law. And more importantly, open to being sued by Unisys. After the initial furore died down, it turned out that it

was possible to produce software that would read GIFs and that didn't infringe the Unisys patent, but to write them you had to pony up to Unisys.

When Unisys first asserted its software patent rights to the LZW algorithm, it caused quite a stir. Luckily, LZW is now out of protection and can be used freely. ■



The LZW algorithm for producing GIF files has been released from captivity.

GOING FURTHER

DrawImage is quite a versatile method of the **Graphics** class. It has around 30 overloaded methods to do various bits and pieces. Some of these are used in straightforward fitting of an image to a graphics surface but there are other things you can do. By setting an array of three point objects as one of **DrawImage**'s arguments, you can skew, rotate or flip the image over.

Our second problem is a little more subtle. It's due to the **resize** event (caused by setting the **PictureBox**'s **Size** property). The corresponding **OnPaint** Window message, handled by the **Paint** event handler, only specifies that part, not the whole, of the resized window is to be repainted. It makes the assumption that the original part doesn't need to be repainted, but in our case it does. This is easily dealt with by forcing a repaint after the **resize** code by calling the **Invalidate** method:

```
pb2.Size = s
pb2.Invalidate()
g.Dispose()
```

Also, it's worth noting that it's a good idea to call the **Dispose** method of a **Graphics** object that you created when you are finished with it. Normally, the graphics object will be cleaned up by the garbage collector at some future (unspecified) time. However, graphics objects can be quite large and use all sorts of internal Windows resources, which are not explicitly tracked by .NET's memory management. The garbage collector could be some time before it actually gets round to freeing these resources. This isn't going to be much of a problem with a single program on a PC, but it might well become a problem with a server where each individual program might not necessarily be short of memory, but the system as a whole could be, due to the consumption of internal Windows resources. It's considered good practice to call **Dispose** as soon as you're done with a graphics object.

Now let's add some scroll bars so that we can move the picture round in a window. You can add your own scroll bars

by using the **HScrollBar** and **VScrollBar** controls and position them anywhere on the form as you like, but they really work best within a 'container'. If you do this, you can dock them to the bottom and sides of the container.

The easy way to do this is to use a **Panel** as a container. Like most Windows controls, it has a graphics surface, that can draw on as required. Using the scroll bars to move the image around. It turns out that the **Panel** control inherits from the **ScrollableControl** class, and you can set it automatically to have scroll bars. However, you can't use these directly to scroll an image on the panel's graphics surface. Instead, you have to draw a control – another **PictureBox** – inside the panel and use that to draw your image wherever necessary.

So a simple way to draw a scrollable image at design time, is to place a **PictureBox** somewhere in a **Panel** and then position the **PictureBox** at the top left-hand corner using the **Locate** property. This positions the control relative to the control's containing control – in this case the **Panel**. We can get it to line up nicely like this:

```
pt = New Point(0, 0)
pb3.Location = pt
pb3.Size = s
```

Again, we need to set the size of the **PictureBox** to the real size of the bitmap as we calculated previously. The scrollbars will appear as the **PictureBox** is resized at runtime.

The program on the **SuperCD** demonstrates the above points. Since the code isn't very complicated, it's definitely worth playing around with it and trying out variations on the basic ideas. **PCP**

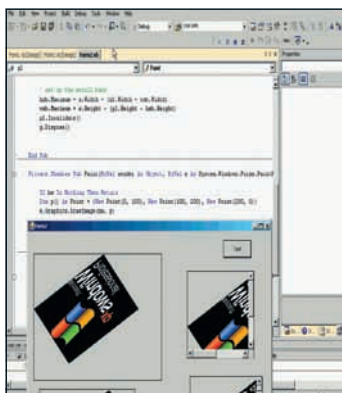
NEXT MONTH

Having got a bitmap into memory and displayed it this month, we'll start pulling it apart next month.

Reflections

If you want to see what's going on in .NET code, use a mirror

Reflector looks into the code in .NET assemblies, which can be useful for tracking down bugs in the .NET Framework.



One of the real gripes I've got about .NET is that Microsoft doesn't provide the source code. Sometimes you really need this on hand to work out what's going on – especially given the often inadequate state of the .NET documentation provided.

This is where open source systems win hands down over Microsoft. That, and the minor fact that open source things are usually free. Incidentally, I can't say that I'm impressed by the arguments about quality differences. In my experience, open source and Microsoft are much the same. (If you want some really buggy commercial software, try hardware manufacturers – it can be dire).

Anyway, I'd heard about **Reflector** (www.aisto.com/roeder/dotnet) from several sources, commenting on how useful it was for seeing inside .NET code, and suggesting I give it a try. The two problems I was looking for assistance with were **DrawImage** and I was also curious about what really was going on with my **PeekChar** problem (see issue **PC Plus 219**).

With my first problem, **Reflector** wasn't a great deal of help. It turns out that **DrawImage** is a very simple 'wrapper' around a 'flat' GDI+ API call and that was all there was to it. I didn't get any useful information from **Reflector** apart from the fact that .NET didn't do anything.

The second problem was more interesting. **Reflector** did display the reconstructed source for the routine at

the heart of the problem, **InternalReadOneChar**. And this does read two bytes. The problem seems to come when converting from two bytes to a single Unicode character. The error occurred in the routine, **GetChars** which under some circumstances signaled an 'Argument Conversion Overflow' which is what I saw. So full marks to **Reflector**. But the problem remains that without the source code I can't fix it!

Here's one final 'reflection', though. Is **Reflector** legal? We've all read a **End User Licence Agreement (EULA)** before haven't we? One of the terms is usually that you won't disassemble the code. **Reflector** does just that. But since the **EULA** gives you virtually no rights whatsoever and the software company the right to sell you a bug-ridden heap of junk; 'See you in court, Bill'. ■

This series	Part One	Part two	Part Three	Part Four
Building a Markov Chain Text Generator	How to make use of freeform text	Dealing with large amounts of raw text as data	How to convert data back to freeform text, and why	Tidying up and generalising our generator program

Getting meaning from data

PROJECT TIME



2 HRS 00 MINS

SKILL LEVEL



7 INTERMEDIATE
General knowledge of programming fundamentals will be helpful.

YOU'LL NEED THIS



Any programming language, but QBasic (free) is used here for illustration purposes.

FILES ON SUPERDISC



Any files you need to complete this Masterclass are on this month's SuperDisc. Look in the Programmer's World section.

We have done all the analysis needed for adopting a particular author's style, but **Wilf Hey** explains how you put it to work

In the first two parts of this Masterclass we looked into Markov's little trick; making a statistical analysis of cause and effect. Like punters at the racecourse, he studied the 'form' of chains of related incidents, and established how likely any particular sequence would actually happen. These 'Markov Chains' happen wherever chaos is not reigning. Markov chaining cannot help you predict what hand will be dealt to a poker player, but it may well give good hints based on the subsequent behaviour (bets and so on) of that player.

We concentrated our attention on partition sorting last month. In fact we built MARKOV02, a program essentially made up of three such sorts. Though I explained at each stage the need for these sorts, you will be able to appreciate the working of Markov chaining only by observing it at work.

Melville, the author of 'Moby Dick' wrote in a distinctive style easily spotted if you know its characteristics from reading his works, but it turns out that this is, in fact, true of almost all writers – unless they are consciously aping somebody else's style. Markov chaining has been used to spot rogue paragraphs that have been written by a second person and inserted into the middle of an authentic document: an expert will be able to see breaks in the chain that exceed probability.

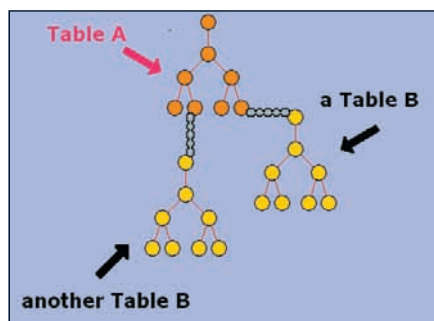
It should be noted, though, that Markov chaining depends on chance, and the one certainty there is about using it is that you can come unstuck, if you are not cautious: it is most unlikely that the Markov chaining in a James Bond novel would resemble the same analysis of a Chitty Chitty Bang Bang story.

Putting aside such anomalies, a Markov chaining analysis will be able to note whether an author uses a simple vocabulary, subjunctive mood ('if' fantasies), passive verbs, or lengthy sentences. Suppose we look at how we should write a paragraph in the style of Herman Melville. Suppose we decide that many of his paragraphs begin with 'The': at least this is a way to start.

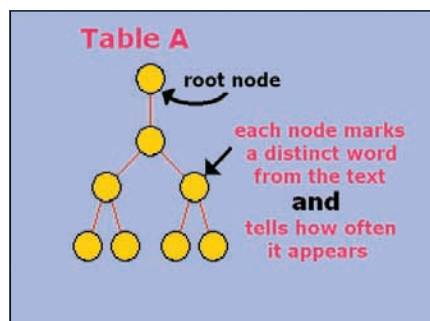
How shall we determine an appropriate second word – one that follows the Melville style? If we can find all the words Melville has used immediately following 'The', we can choose one from among them. In our analysis, done by MARKOV02, we performed a partition sort of all the words in alphabetical order. This produced a binary tree (Table A) with a different word at each node and searching for a particular word is swift and easy. When we get to the node for 'The', we find a pointer to an instance of Table B. Every node in Table A has its own Table B. Note that: one Table A, but one Table B per word. Each Table B is itself a binary tree in which each node is a different word that immediately follows 'The'. Often it is 'man', 'ship' or 'whale', but there are lots of other possibilities. If we now select the most frequent word that follows 'The', results would be interesting, but stale. If we were to do this, we would be locked into a cycle that produced the same sample every time.

1 Avoiding repetition It may sound more natural, and will certainly be more varied, if there were some opportunities where something other than 'ship' might appear after 'The'. We can use a randomiser to choose between possible words. If we are to use a randomiser, how are we to retain some sense of style? We would be using Melville's vocabulary, but almost nothing of his

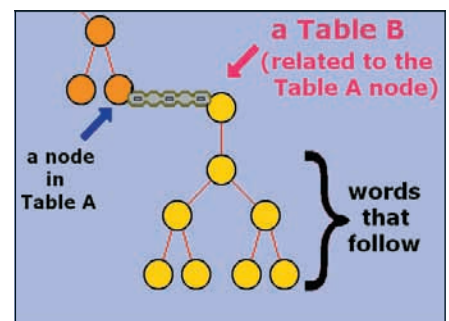
Shaking the binary tree



The data we organise with the 'flywheel' program (like MARKOV02) contains the fundamental principle behind Markov chaining – simply several binary trees. Looking at the logical organisation, we see that each node in Table A is chained to its own Table B.



Every word from the input text is represented by a node in Table A. The node also records how often its word appears, which is used to select a random number, which in turn determines the word in the associated Table B to become the next in sequence.



There is a Table B associated with each word (node) in Table A, and it is made up of details of each of the words which follows the Table A word directly. It is from the Table B chained to each Table A node that the Markov text generator selects the next word.



Wilf Hey

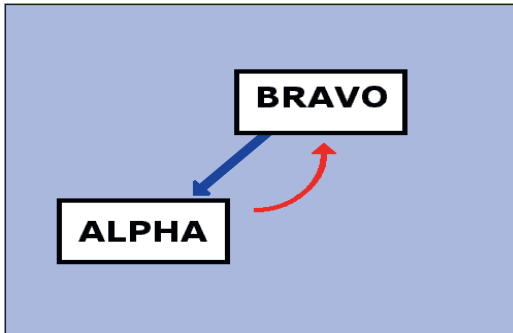
wilf.hey@futurenet.co.uk

Wilf Hey has been grappling with programming for several decades now – he hasn't been counted out yet

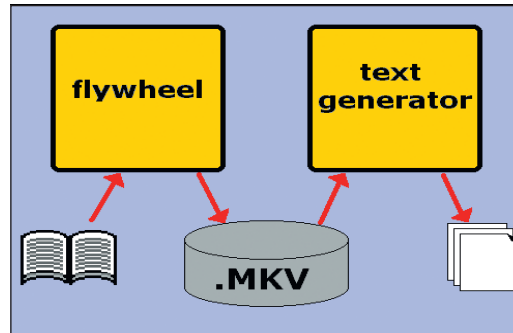
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When processing a binary tree sequentially the normal partition links do not suffice: there is no natural reverse (in red) from a left branch node (ALPHA), so one must be provided artificially.



The full suite for following Markov chaining in a novel consists of two programs: the flywheel digests the novel's contents as data and the generator produces text from it.

PASSING SHOT

There are many faults arising in Markov-generated text. Logical sense is not the only casualty. Verbs may switch disturbingly from past to present, then back to past. Quotations may start, but never mind an ending point. A parenthesis may open but never close, or close without ever starting.

It may be complicated, but surely you could enhance the presentation module of your Markov suite so that it attends to some of these picky little matters. Can you anticipate them well enough to program a way around them? Note that we have not even broached the subject of monitoring the passage for intelligent meaning. Doesn't C3P0 (the urbane walking robot in the Star Wars films) seem a little further from feasibility just now?

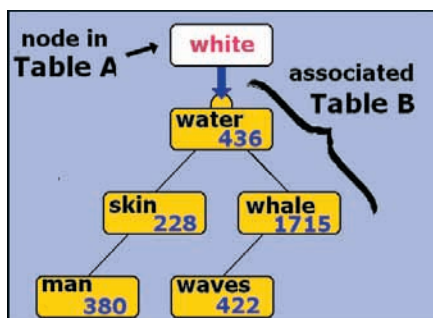
distinctive habits (such as use of adjectives). The way is simple: we will use our randomiser to select a word with the same distribution as Melville used. We have done this in recent months – particularly in the last two Masterclasses. Let's take a tiny example: 'purple' is followed by 'rage' twice, 'dress' three times and 'sands' five times. We obtain a random integer from one to ten ($10 = 2 + 3 + 5$). Suppose that integer is five: this would indicate a selection of the word 'dress': one or two would indicate 'rage', three to five 'dress' and six to ten 'sands'. Over the course of time you would expect to find 'purple' followed by words in the same proportion as in the original text analysed.

What data do we need for this process? The random integer must be between one and the number of times the first word is used, so the frequency of the first word must be recorded at its node in Table A. The frequencies of the possible second words must be taken into account, so that must be recorded in each Table B entry relating to the node in Table A. Once we have a second word we can go on to

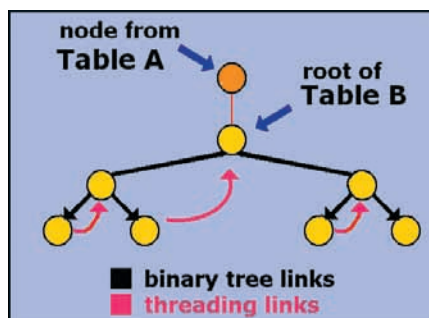
fetch a third word and a fourth in the same manner until we have a paragraph. Easy – or so it would seem.

2 Navigational problems It may appear simple, but there are still some technical matters. Taking our earlier example of three words in the Table B attached to the node 'purple' in Table A, it seems easy enough to decide on choosing one of the three. But what if there were dozens of words, as with the node 'white'? It goes without saying that 'whale' will be common enough, but 'water', 'skin' and 'man' all appear immediately after 'white' often, too. Suppose you now have a random integer: how do you relate that integer to one out of all these words? You will have to go through the words in a specific order, whittling down the random integer until it reaches zero. When it does, the current word in queue will be the selected one.

But you have a major problem getting this word from Table B: a binary tree does not provide a means of scanning its nodes in a queue. You may remember when we



Though several words may follow any particular word on which we focus, it is important that some are given more weight than others. The Markov text generator can do this by noting the relative frequency with which each possible word appears.



Each Table B is itself a binary tree, though much smaller than Table A. Once the relevant Table B is located, its nodes are processed in sequence, so threading must be incorporated when it is created.

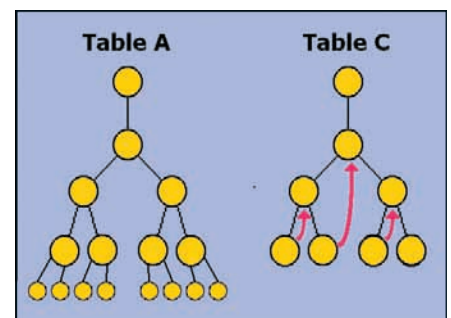


Table C only marks and counts words from the text and does not entail any Markov chaining itself. It's shorter because its nodes are only capitalised words. Its use – for starting paragraphs – requires its nodes to be navigated sequentially, so it needs threading.

Working out whitespace

It doesn't take much experience with a program to see where improvements are desirable

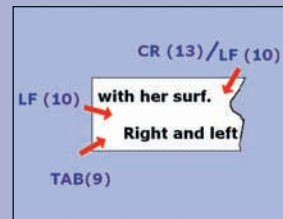
Do you see any opportunities for improvement in either part of the Markov generator suite? I simplified the original text of 'Moby Dick' by removing numbers and getting rid of all formatting codes so that whitespace consists of spaces only: this is rather like mother cutting your food into small pieces. The real world deals with tab

(9), carriage return and line feed (13, 10) typically peppering text, all to be considered as whitespace. Maybe you should consider going back to Part 1 again and make changes that suit unsimplified text.

We used partition sorting for all three table types but we had to incorporate threading in two of them so that their

entries could be retrieved sequentially.

Threading is simple, but wastes some time: you have to find the lowest entry, and subsequently ignore already-viewed records. Ask yourself, would it be helpful to reorganise each threaded table on the first occasion so that all pointers are direct? We shall look closer at this next month. ■



In the simplified text form of 'Moby Dick', whitespace is composed of spaces only, but normally carriage return (CR), line feed (LF) or TAB are all counted as whitespace.

GOING FURTHER

There are plenty of literary works on the web that can be downloaded without legal complications. A generalised Markov suite of programs would be interesting. You could develop a database to encapsulate Shakespeare, for instance (but would you get iambic pentameters?) and another to capture the essence of Lewis Carroll. In fact, I have given both these authors the Markov treatment with considerable success. Of course the results are not serious, but the techniques you develop in this project will give you insights into the use of language, which will, hopefully, inspire you to consider on a deeper level the importance of a clear human/computer interface.

NEXT MONTH

Next month we will pull together all the pieces, tidy up any loose strands within our Markov generator and make it more generalised.

created Table A and Table B, there was one significant difference between their construction: threading. Each example of Table B is not simply a binary tree: it's a 'threaded' binary tree.

A binary tree is great for confirming that a value exists within data: to find a word (say 'white') you test a few partitions, each test getting you nearer to the word, often cutting out half the 'wrong' possibilities at a stroke. Very soon you will get to a node that has that word, or indicates that there are no further partitions, so the word must be absent from the table. But this structure does not make it easy to decide the very next value in sequence. Navigating a tree is tricky because the linkage to the next node depends, perversely, on the order in which the nodes were added to the tree.

It's easy to get to the node with the lowest value in a tree: starting at the root, you take the left ('less than') link until you run out of them. The next node in sequence from this lowest node will be the one recorded at its right link – but only if there is a right link. If there is, you must go back to the parent link. This seems to be an easy problem to solve: in each node, simply have a link back to its parent. That is, to the node from which it is a left branch. But what about the next node in sequence if the current node was a right link, but has no right link itself? You will still want to go back to the parent node even if it has already been counted in sequence, so we can search further. Did you follow all that? Hmm... maybe sequencing a binary tree is not so simple.

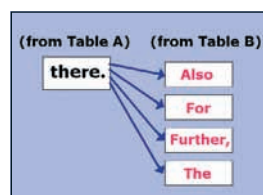
Threading is the strategy that we can incorporate into each Table B in order to make possible navigation around the data in sequence, as we need. It consists of an extra pointer created with each node, showing its parentage. This is like a stitch in sewing terms. If the node is on a left branch, this stitch points back to its parent node. If the node is on a right branch, this stitch is copied (or inherited) from its parent node. The method of navigation sequentially using this threading is fairly straightforward:

1. Take left branches until there are no more. Where this stops, process the node.
2. If there is a right branch from a node just processed, take that branch, then go to step 1.
3. If there is no right branch from the node just processed, take its thread instead. Process the node at that point.

You may wonder whether it would be better to use some other method of sorting for the instances of Table B, so that you can avoid having to incorporate threading. You may like to experiment, but threading isn't so big a complication, and partition sorting is itself very swift, and not too difficult to program. By the way, you will notice that if a node has a right branch, it has no threading, and vice versa. As a matter of fact, instead of room for three pointers (left branch, right branch and stitch) you can get away with providing room for only two; but note that you should have a switch, so that the sequential processing routine can tell whether a particular value is a right branch or a threading stitch at each node.

Even with the simple, self-working partition sort algorithm that we use here for all three types of table, it can become quite confusing how things link together. Our MARKOV02 program only produces a file, so it's not easy to tell whether it has accomplished its objective. Can you devise tests (short of the final project conclusion) to confirm that the programming is sound?

One method is to build in a word lookup subroutine for each of the three types of table – remembering that each whole Table B sprouts from a single entry in Table A. Then in debug mode you can look up in the MKV file a test word that appears a number of times. For example the word 'ago' occurs (by my reckoning) a dozen times, and there are eleven words in its associated Table B (one word – 'were' – occurs twice). You can confirm this without too much difficulty by loading MobyDick.txt into your wordprocessor and searching for every occurrence of 'ago' with a space following, and not part of another word. **PCP**



Entries in Table A carry any following punctuation, so 'there.' and 'there.' are different nodes. Usually the words chained to those that end with a full stop are those that begin a new sentence or paragraph.

Making sense of sentences

The working of your Markov Chain engine is almost automatic

How do you get started with a representative 'invented' passage? We can move from word to word with the vocabulary and pacing of Melville by looking up a given word in Table A to locate its Table B, and selecting one of the Table B words with the aid of a random integer, and repeating the process (looking up the new word in Table A).

Sentences customarily begin with a capital letter. If we select at random a word from Table A and ensure that it begins with a capital letter, then at least we'll be starting with a qualified word. A capital letter may be used for other

purposes, such as personal and geographic names. This would be a hit-and-miss method though and is unlikely to match the pattern of Melville's style. We want an abbreviated version of Table A, containing only capitalised words and make sure it's threaded so that the words can be seen sequentially. This is the nature of Table C, which your engine builds on the basis outlined last month. You start a paragraph by generating a random integer between one and the total number of capitalised words. Then using the same method you did with Table B, you select a qualified word and

use that for the start of the paragraph.

You don't have to do anything special to start any sentence except the first. All the standard punctuation is carried along with the words immediately preceding them. Eventually your engine will select a word ending with a full stop, such as 'ship'. Using its associated Table B you will find that all the words following immediately after it are capitalised. Whatever word is chosen will appear as the starting word of a new sentence. It is as if the end of one Markov chain automatically starts the next. All you have to do is know when to stop the chaining process. ■

Rants and raves


www.futureforums.co.uk/pcplus


This month Harry Potter lookalike, **Huw Collingbourne** delves into the dialect of South Wales and goes to work on an Egg...

Trust no-one. This, increasingly, is a precept which guides my daily life. When Mulder and Scully urged us to "Trust no one" back in the 1990s, it was extraterrestrials, governments and their black-suited minions, which they seemed to have had in mind. Those were more innocent times – before the biggest tool of mass misinformation ever invented had come to dominate our lives.

Now we are all just a mouse click away from international crime. Almost every day, I am now in direct contact with fraudsters and villains from around the world. Some of them (mainly from Nigeria) actively encourage me to join in their felonious activities for monetary gain. Others (often from Central and Eastern Europe) employ more subtle methods in an attempt to trick me into giving them my credit card details.

My mistrust is now so great that I have even started to doubt the probity and integrity of my bank. Just this week, I received an email from the Egg online bank encouraging me to register for their new Money Manager service. This would provide me with a single screen in which I would be able to manage all my online accounts from Egg and other banks. Just by registering

I would have the chance to win a £2,000 prize!

This sounded so good that I wasted no time in logging into Egg and signing up. When it came time to add my other bank accounts, I started to have my doubts. Did Egg really need to know my login details and passwords for those accounts? Suddenly my heart skipped a beat. Hadn't I been here before? I mean, wasn't this suspiciously like the eBay registration screen I'd visited a couple of months ago (see issue 218), which asked me for all kinds of impertinent details about my credit card account? While it looked remarkably genuine – even down to the real eBay address displayed in a fake Internet Explorer address bar – that eBay registration screen turned out to be a scam.

Weighed down by paranoia, I spent a good half an hour checking that the Egg site was what it purported to be and not just a clever fake. Had I logged onto it by entering its address by hand rather than clicking a link in an email? Did it display 'https://\V' in the address bar? Was there the 'lock' icon indicating a secure site in the bottom right of my web browser? Was the address bar genuine? Eventually I decided that this was the real Egg site and so, with a trembling hand, I entered all the security details it asked for.

Speak and spell

It then occurred to me that gathering all my accounts onto one site inevitably compromises my security. Normally I used different passwords for each bank. But now, one password would give access to all my bank accounts. A case of putting all my eggs in one basket, you might say.

The very least I could do would be to change my Egg password to something new. Surprisingly, Egg does not let you do this online. Instead you have to do it over the phone. This struck me as bizarre. If I did it online, only I would know my password. By dictating it over the phone, I had to

place my trust in a stranger at the other end of the line. And how could I be absolutely sure that someone wouldn't overhear me as I said my password or that someone at the other end wouldn't be listening in on our conversation?

My worries were somewhat allayed when the person I spoke to at Egg took me through the security procedure. During this, he asked me to reveal only two letters of my existing password and instructed me specifically not to reveal the entire password. But when I told him that I wanted to change my password, he told me to spell it out in its entirety! I was left wondering why it's deemed necessary, for security purposes, to conceal an old password but it's perfectly OK to reveal a new one?

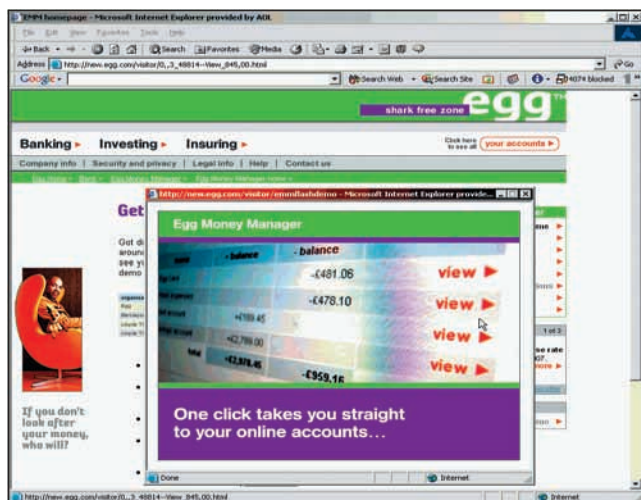
I put my concerns to Egg's Internet Customer Services Department. This is what they replied:

"When you re-set security over the telephone you do need to reveal your password to a member of staff in order to set it up. This however is the only point when we would ask you to reveal the word in its entirety.

"When you next call us, your password is not visible to any member of staff and we ask you not to disclose the password in full just in case you may be overheard at your end. This is the reason why we also ask you, during reset to ensure that you cannot be 'overheard', using a 'mobile or cordless telephone' as we have no wish to have the call intercepted. "There are no plans at the moment to change this process, but we're making changes to the way you can log in. Details will be available on the website shortly." In essence, what this boils down to is: "Trust us, we're bankers." Yeah, well, I'm sorry, but I'm with Mulder and Scully on this one.

Teach yourself Wenglish

Tamping is how I get when people say I'm all jaw but I have to admit that I'm in my oils when I'm chopping and

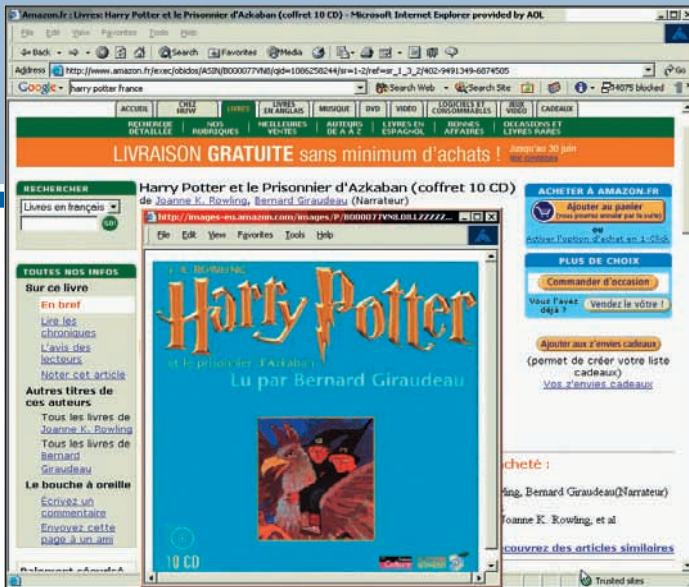


The new Money Manager service from Egg enables customers to view accounts with other banks too. I'd feel safer if it also let me change my password online.



Huw Collingbourne
huw.collingbourne@futurenet.co.uk

Huw Collingbourne began his training in wizardry at the tender age of seven but was expelled after turning his Biology teacher into a laboratory rat



You've heard the Stephen Fry version, now try the Bernard Giraudeau alternative. For language students, Harry Potter audio books are a treat. C'est magique!

potching about. And if you can't make head or tail of that, you obviously don't speak Wenglish.

Wenglish is a word coined by the writer, John Edwards to describe that

language of the type, which would not be deemed fit to grace the fair pages of PC Plus. It's with due warning then that I direct your attention to another site run by Chris Lewis, the person

"Why is it deemed necessary to conceal an old password but reveal a new one [to a stranger]?"

eccentric mix of English and Welsh, which forms the dialect of the valleys of South Wales. Edwards' two books on the subject are now, sadly, out of print. For a crash course on Wenglish, however, I can recommend the excellent 'Talk Tidy' site at www.talktidy.com.

Language in all its forms is one of my great interests. That includes

responsible for talktidy.com. The Online Dictionary of Playground Slang (www.odps.org) lists numerous slang terms that weren't heard in playgrounds when I was at school. To avoid embarrassment, I would suggest you don't show this site to your parents!

Potter a la carte

If you followed the recent Language

Learning Masterclasses, you will know that my interest in language extends beyond the profane. I am currently struggling to learn Mandarin Chinese while simultaneously brushing up my rusty French and rustier Welsh.

One thing I've discovered is that language courses aimed at 'brushers up' are considerably thinner on the ground than those aimed at beginners. Internet radio at least provides a good way to keep your ear attuned to a language. The more advanced student of French will find some excellent resources at Radio France (www.radiofrance.fr). I particularly recommend the France Culture pages, which give you access to an audio library of stories, plays and discussions.

Special mention must also go to J. K. Rowling. The Harry Potter phenomenon means that you can not only find books on the boy wizard in every language from Welsh to Ancient Greek, but you can listen to an audio-book version as well. I have just ordered the 10-CD French audio book of 'Harry Potter et le Prisonnier d'Azkaban' from www.amazon.fr. It may not be as intellectual as Proust but it's a lot more fun... **PCP**

GOING FURTHER

If you want to steer clear of fraudulent eBay sites, you would do well to study eBay's guide to spotting a fake: <http://pages.ebay.co.uk/education/spoofutorial>. Unlike the Egg online bank, eBay believes users should change their password frequently and it lets you do so online. If you want to protect your privacy further, think about taking measures to remove any 'spyware' that has been copied onto your disk. Spyware is a broad term that describes any software or tracking files ('cookies') which can silently transmit information about your computer or Internet use to a third party. SpyBot will help you zap the critters (www.spybot.info).

The Welsh connection

Two CD packages take dramatically different approaches to teaching the language of Heaven

These days my PC has almost replaced my stereo. In fact, it spends more time spinning audio CDs than CD-ROMs. So when I discovered an audio CD course in Welsh, Harry Potter came out and Cadw Swm went in.

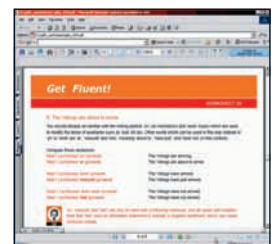
Cadw Swm (£79 from www.cadwswm.com) is an odd language course based on the principle (discovered in Bulgaria in the early 1960s) that listening to classical music helps you to learn. Frankly, this all sounds a bit New Age to me but, heck, it's worth a try.

Each lesson begins with a relaxation track where you are encouraged to listen to classical music while breathing deeply and relaxing your body and

mind. If you are still awake at the end of this you can then go on to listen to a story. The story is read three times in succession, twice with classical music playing, first in the background and then in the foreground. In theory this helps the language 'float' into your mind. In practice, it reminds me of supermarket muzak. Try as I might to relax, the constant battle between speech and music only succeeds in making me irritable. I suspect that Cadw Swm may be more effective for laidback learners than for a hyperactive computer journalist.

Another CD, 'Get Fluent In Welsh' (www.getfluent.co.uk), takes a

dramatically different approach – there's no audio at all. The lessons are provided as PDF worksheets based around themes like 'Going on Holiday'. Each lesson includes some sample passages in Welsh, lots of exercises, grammar notes and a long list of vocabulary. This is not a self-contained course but, rather, a collection of material to extend the learner's range of expression. For someone like me, who just wants to 'dip in' to revise the language, it's absolutely perfect. At £21.50 for every ten worksheets (40 are available with French worksheets coming soon) Get Fluent isn't cheap. Then again, I don't know of anything that really competes with it. ■



In my experience, 'The Vikings are about to arrive' is not an expression that is taught by most language courses. 'Get Fluent' is a notable exception.

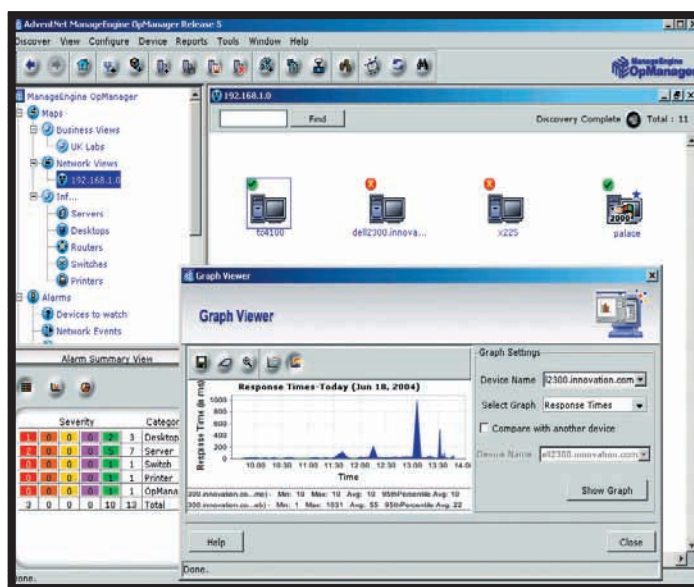
NETWORK DEVICE MONITORING

AdventNet OpManager 5

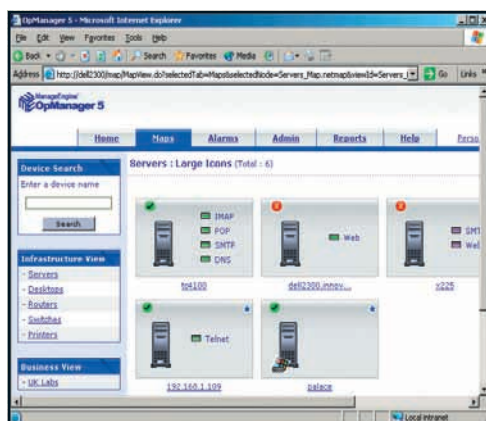
Although development of Simple Network Management Protocol (SNMP) has been a slow process, it does offer an easy way of monitoring and managing just about any compliant network device. It also allows vendors to deliver a product that doesn't cost the earth and can keep an eye on systems ranging from servers to workstations and switches to network printers. OpManager 5 is a perfect example as it provides an extensive set of network monitoring tools, but comes in with a price tag that makes it suited to small businesses on a tight budget.

Installation on the management server is a simple process and OpManager automatically loads its own copy of MySQL, which it uses to store its own parameters and details such as inventory and events. We would recommend adhering to the minimum hardware requirements otherwise you'll find OpManager can be sluggish. On first contact, OpManager fires up a wizard, which asks for SNMP details for the monitored networks and also starts up an auto-discovery routine on the specified subnets. It's here that the documentation structure could be better organised as it is essential that your devices have SNMP enabled and configured correctly and yet this crucial step is left lurking at the back of the manual. Understandably, security is the biggest issue with SNMP and has been addressed significantly in v5, but few products support this. Consequently, SNMP is not installed by default on Windows systems and many other devices have support disabled. It's easy to load on Windows systems. You'll also need to configure trap destinations and which hosts will have SNMP requests processed by the local system.

OpManager's Java-based client opens with a cheerful interface full of chunky, colourful icons and graphs making it easy to navigate. The network view shows all discovered devices and this can be customised with a business view which allows maps to be used to represent the physical layout of your organisation. OpManager attempts to identify each device type and place it in the relevant group. It did a fair job on our test network by correctly spotting the six test Windows servers and two Windows workstations, an SNMP-enabled Oki laser printer and a couple of network switches. OS identification wasn't so impressive as it thought the three Server 2003 systems had Server 2000 installed. When we advised AdventNet it created a patch to recognise the relevant SNMP OIDs, which remedied this. The printer icon



OpManager's colourful client interface provides real-time graphing facilities while easily identified icons show the status of monitored network devices.



Get remote web access to the OpManager server from a tidy browser interface.

was accompanied by a graphic with indicators showing power, low toner and paper out status along with open door warnings, which we found worked fine on our test printer.

OpManager uses simple colour-coded status icons for each device showing clearly what its condition is. A green circle says all is well; a purple blob indicates a service is down; while a red disc indicates a system is unavailable. All identified services get status indicators added to the icon of the device they're running on. To avoid generating excess network traffic you can specify the polling intervals for each device group, so critical servers and services could be checked say, every five minutes, while workstations are only polled once an hour. The dependency option is an important feature when monitoring multiple

devices as there's no point generating masses of warnings for each attached device if a network switch goes belly up.

With OpManager you can access each device icon and view an asset inventory, see a real-time snapshot complete with processor, memory and hard disk usage, and load utilisation graphs

of selected components. Thresholds determine how OpManager reacts to problems; notifications are used to warn when these are breached and you can choose to send emails, an SMS, run a system command and run a program. Any attribute that's accessible via SNMP can be monitored.

OpManager has a number of rough edges and is clearly a work in progress, but it does have a lot going for it in the network management stakes. It's easy to use with a well designed console interface, offers good monitoring and alerting facilities. Although dependent on each device's level of SNMP support is capable of providing plenty of information about a variety of network systems.

Dave Mitchell

INFORMATION

PRICE Single user £510 (£434 ex VAT), Five users £1,602 (£1,363 ex VAT)
SUPPLIER AdventNet 020 8741 1948
INFO www.adventnet.com

REQUIREMENTS

CPU 800MHz Pentium III
RAM 512MB
OS Windows NT, 2000, XP
CLIENTS Any SNMP enabled device

IN A NUTSHELL

There are plenty of SNMP-based management products on the market but OpManager provides a fine toolbox of features for a reasonable price, and can monitor just about any compliant device. The brightly coloured interface is easy to use, although there is still work to be done on some of its recognition capabilities.



The Snapshot feature provides a useful overview of selected systems and their utilisation.

PCPlus ratings

ADVENTNET MANAGEENGINE OPMANAGER 5

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●

OVERALL

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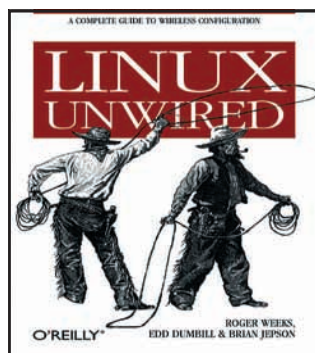
LINUX

Linux Unwired

PRICE £12 (£10 ex VAT) ISBN 0-596-00583-0 AUTHOR Weeks, Dumbill and Jepson
SUPPLIER www.amazon.co.uk

Windows users are blessed with a shelf full of reference books explaining how to get a wireless networking up and running, not that one is really needed as nearly all wireless kit works out of the box without fuss on the Microsoft platform. Linux users are given no such bounty of either books or compatible kit. This 'complete guide to wireless configuration' from O'Reilly is a no-nonsense dissection of Linux wireless computing that goes some way towards addressing this problem. It can't build your Linux Wi-Fi network for you, but it can explain the problems you'll face, and provide workable solutions. Much of the book covers 802.11b, although the 'a' and 'g' variants do also appear, as do Bluetooth, GPS, Infrared and Cellular (GSM/GPRS). The last two of these we could do without: IrDA is all but obsolete in the 21st century, and 'cellular' is aimed solely at the US market, so don't expect to see any network providers you've heard of in the UK.

On the whole, the book works as



a hands-on reference guide to choosing the right wireless kit for Linux networking; make an uninformed choice and the lack of Linux support for WEP may leave your security compromised, for example. 'Out of the box' isn't a commonly heard phrase in the Linux community, but perhaps 'out of the book' should be! If you want your Linux wireless network with the minimum fuss, it's an essential read.

Davey Winder

OVERALL

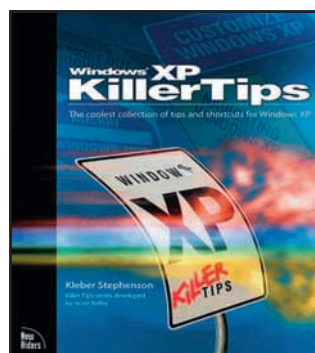
8

WINDOWS

Windows XP Killer Tips

PRICE £18 (£15 ex VAT) ISBN 0-7357-1357-X AUTHOR Scott Kelby
SUPPLIER www.compman.co.uk

Are you a tweaker rather than a hacker or a user? It's an important question, because how you define yourself will determine the value you get from this book. A user may change a few superficial things about the OS but not delve too deeply; a hacker will get deep inside the code and force change for a specific purpose if that's what it takes. The tweaker, however, will have an almost unquenchable thirst for what are best described as sidebar hints. These are, things you didn't know you could do with Internet Explorer, and probably didn't need to, but that's beside the point as a tweaker will try it anyway. This book is full of them, it's wall-to-wall hints and tips covering just about every aspect of Windows XP. Let us illustrate by opening the book randomly: compress folders and directories, web browse from any window, add comments to shortcut icons, associate files with multiple apps, create a vcard, empty prefetch folder and much more – see, it



has something for everyone. Sure, if you wanted a specific tweak for a specific purpose then it's easy enough to Google it, but stick to that regime and you'll never discover the hidden gems. These will be different for every reader, of course, but that's the joy of this book. I dare anyone to dip into this tweaking treasure trove and not find something that makes you say, "I never knew that".

Davey Winder

OVERALL

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WEB DESIGN

More Eric Meyer On CSS

PRICE £28 (£24 ex VAT) ISBN 0-7357-1425-8 AUTHOR Eric A. Meyer
SUPPLIER Computer Manuals www.compman.co.uk



Eric Meyer is to Cascading Style Sheets what Egon Ronay is to restaurant food – the undisputed heavyweight author in his field. The first 'Eric Meyer on CSS' led the way in teaching CSS by example to web developers keen to understand in practical terms how to use style sheets in their real world projects. It became both a best seller and the industry standard reference. You don't need to have read the original to get the most out of the new book, but you will need an understanding of what CSS is and how it works, so if you are at the beginner stage you might want to purchase them both.

'More Eric Meyer on CSS' doesn't mean more of the same, at least not in the worse sense of the phrase, but rather a natural continuation of the project-based learning curve. If you want to sharpen your design skills and move up a gear, as far as CSS is concerned then this is without doubt the best roadmap available. There are 10 projects, written with the linear reader in mind, each



building on the skills and understanding gained before. You begin with 'converting an existing page' and progress through 'positioning of the background' and 'CSS driven drop down menus' to 'styling a weblog'. The feel of the paper stock and the full colour printing echo the superior quality of the content. If you only buy one book on CSS make it this one, but the smart money will go for the pair.

Davey Winder

OVERALL

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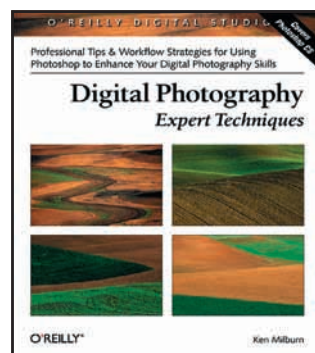
DIGITAL PHOTOGRAPHY

Expert Techniques

PRICE £22 (£19 ex VAT) ISBN 0-596-00547-4 AUTHOR Ken Milburn
SUPPLIER www.amazon.co.uk



Too many books promise to enhance your digital photography skills and fail to deliver because they're aimed at the total newbie to both photography and computing. There are precious few that realise that many of us are capable of using a camera and at the same time have more than a little familiarity with computers. Ken Milburn has filled the gap admirably with this 468-page tome that is, wait for it, subtitled 'Professional tips and workflow strategies for using Photoshop to enhance your digital photography skills'. Covering Adobe Photoshop CS, it is almost a field guide to setting up and using a digital darkroom for the serious user. Full of hints and tips along the way, it establishes a start-to-finish workflow which professional photographers would be hard pressed to find fault with. This is not, and it should be emphasised as much as possible, a book for the beginner in any sense. You will need to have a working knowledge of Photoshop and be an experienced



amateur photographer, but you will learn a surprising amount more about both by the time you finish. There's pre-shoot preparation, creating archival quality prints and selling photos on the web, with all the problem solving and solutions-based advice you could need in-between. At last there is a book for the 'prosumer'! And if you don't know what the word means this isn't the book for you!

Davey Winder

OVERALL

10

INFORMATION

PRICE £504 (£429 ex VAT)
SUPPLIER www.dabs.com
INFO www.canon.co.uk
WARRANTY One year

SPECIFICATIONS

PRINT RESOLUTION 4800x2400dpi
WRITE SPEEDS 16ppm (A4 mono),
 12ppm (A4 colour), 1.19ppm (A4 photo)
COLOURS 8 separate tanks
CAPACITY 150 sheets A4
SIZE 577x334x182 mm
WEIGHT 9.5Kg
INTERFACE USB 2.0,
 FireWire, PictBridge

A3 INKJET PRINTER

Canon i9950



Compact and stylish, the i9950 is fast and easy to use and relatively inexpensive to run.

text and colour graphics on both A4 and A3 pages with a great turn of speed. But in photo printing it really excels, with no less than eight ink colours to expand the colour space, boosting the normal CMYK process with

additional Photo Cyan, Photo Magenta, Red and Green. Each of the eight colours are individually replaceable, using BCI-6 cartridges at a cost of around £8.20 each (more on running costs later).

In our tests, the i9950 made a stunning job of reproducing the most vivid colours while maintaining excellent tonal separation, producing dazzling results with a real 'wow' factor. Having said this, it's not the gentlest printer for recreating subtle skin tones, but the excellent colour controls make

it easy to back things off just a little for more muted results if necessary.

As for costs, Canon's own A3+ Photo Paper Pro measures 13x19 inches and costs £2.12 per sheet, sold in packs of 10. The separate ink cartridges are a major advantage because, for example, you can expect to get over eight times as many photo prints from a red or green cartridge than from a photo magenta cartridge. In our tests, printing a range of photo prints, the total ink costs worked out to £1.54 per A3 page. That gives a combined ink and paper cost of £3.66 for each A3 photo print.

Taking the purchase price of the printer out of the equation, running costs compare very favourably with online printing services like Photobox (www.photobox.co.uk), who charge around £10 per 12 x 18 inch print, plus £1.50 for delivery. As for quality, prints from the i9950 actually outstripped those we ordered from Photobox. The Canon's immediate turnaround is obviously much faster as well, our tests producing A3 photo prints in top quality mode in four minutes flat. If you're serious about A3 photo printing, the i9950 is streets ahead of the rest.

Matthew Richards

PC Plus ratings

CANNON I9950

Value	●●●●●●●●●●	10
Features	●●●●●●●●●●	10
Performance	●●●●●●●●●●	10
OVERALL		10

INFORMATION

PRICE £351 (£299 ex VAT)
SUPPLIER Fujitsu 020 8573 4444
INFO www.fujitsu.co.uk
WARRANTY One year

SPECIFICATIONS

SCANNER TYPE ADF colour duplex
MAX RESOLUTION 600dpi
MAX SCANNING SIZE 8.5x14in
CAPACITY 150 sheets
INTERFACE USB 2.0
SIZE 284x146x150mm
WEIGHT 2.7Kg

DOCUMENT SCANNER

Fujitsu ScanSnap fi-5110EOX



The ScanSnap's 50-sheet input tray can read colour and page info automatically.

options is available from the 150dpi of Normal mode, up to 600dpi in 'Excellent' mode. It has to be said, however, that the 'Excellent' tag might be fitting for document scanning, but with photo prints you won't get the

colour accuracy or sharpness that you'd get from a top-notch flatbed photo scanner. Even so, the ScanSnap makes a reasonable job if you want a stack of pictures in a hurry.

The Fujitsu software has good OCR facilities and can translate scanned pages directly into Word documents or Excel spreadsheets. There's a high degree of accuracy, although, as with all OCR software, a few mistakes creep in. The CardMinder software can also 'intelligently' read business cards, and

you can output information directly into Microsoft Outlook, ACT or Goldmine. Another bonus in the software bundle is the inclusion of Adobe Acrobat 6.0 Standard Edition, rather than the 'Reader' freebie. You can scan pages into Adobe Acrobat's format on the fly, as well as storing, organising, sharing and even emailing PDF files through the ScanSnap software.

But it's the automation that's the cleverest thing about the ScanSnap. Simply press the Scan button on the front and the scanner figures out whether incoming documents are mono or colour, single-sided or double-sided, and scans them accordingly. For double-sided documents, duplex scanning automatically comes into play and scans both sides of pages simultaneously as they pass through the scanner. This means that, processing time aside, the scanner is just as fast for double-sided pages as for single-sided ones. Overall, this is a really well-thought out piece of kit and a smart choice to have around the office.

Matthew Richards

PC Plus ratings

FUJITSU SCANSNAP FI-5110EOX

Value	●●●●●●●●●●	10
Features	●●●●●●●●●●	10
Performance	●●●●●●●●●●	10
OVERALL		8

The new Fujitsu ScanSnap looks like the smallest, neatest desktop printer in the world. It actually has the opposite function, scanning printed pages back into your PC. Drop up to 50 pages in its upright paper tray, press the green button, and you're away. You're not limited to A4 either, as the ScanSnap recognises business cards, letter pages, B5, A5, B6 and A6 paper, as well as 'custom' sizes from two inches square up to 8.5 x 14 inches.

For scanning quality, a range of

INFORMATION

PRICE £1,526 (£1,299 ex VAT)
DELIVERY Included in price
SUPPLIER Dell 0870 901 5818
INFO www.dell.co.uk
WARRANTY One year return-to-base

SPECIFICATIONS

CPU 3.2GHz Intel Pentium 4
RAM 1GB DDR400
CORE LOGIC Intel 865PE
HDD 60GB Hitachi (7200rpm)
DRIVES 4x DVD+RW
GRAPHICS 128MB ATI Mobility Radeon 9700
SCREEN 15.4in WUXGA (1,920x1,200)
SOUND Intel AC'97
SPEAKERS Stereo with subwoofer
COMMS 802.11b/g Wi-Fi, 56K Modem, 10/100 Ethernet
PORTS 3x USB 2.0, 4-pin FireWire, PCMCIA Type II, VGA-Out, DVI-I, S-Video
OTHER HARDWARE None
OS Microsoft Windows XP Pro
OTHER SOFTWARE Microsoft Woks Suite 2004
SIZE 51x359x274mm
WEIGHT 4.1Kg

3.2GHz PENTIUM 4 NOTEBOOK PC

Dell Inspiron 9100

As one of the two big guns of the PC industry, along with HP, Dell is often used as a benchmark for where smaller companies want to be. This means that anything that Dell does is a potential industry-wide trend of the future. Welcome, then, to the chunkalicious future of mobile computing, courtesy of the new Inspiron 9100.

At an astonishing two inches thick, it's the fattest standard notebook that we've ever seen, not counting ruggedised systems like Panasonic's Toughbook. And it's not just the system itself that's outsized. The power supply alone is large enough to fill most people with terror. This is just as well, as you'll need as much adrenaline as possible if you're to survive the physical trauma of lugging this massive laptop about. It weighs over 4Kg, and is around two inches thick. But then the 9100 isn't like other notebooks.

Making its first appearance in a portable PC is the latest revision of Intel's ubiquitous Pentium 4 processor, known as Prescott. That's a 100W desktop CPU in a laptop computer, so it's no wonder the 9100 is as thick as a whale omelette. Other headline-grabbing features include full-on 3D power in the form of ATI's latest mobile pixel muncher, the Radeon 9700 Mobility, and Hitachi's peerless 7200rpm notebook hard drive. It even boasts a DVI connection for flawless digital

connectivity to external flat panels and a subwoofer to improve sound quality and power. Rounding out the bleeding edge specification is a handy 1GB of PC3200 DDR RAM running on a desktop-matching dual channel memory bus. In other words, the entire spec list reads more like that of a

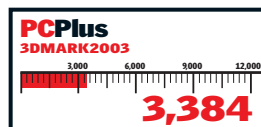
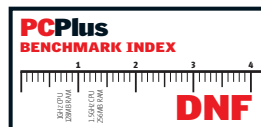
desktop computer.

Performance, unsurprisingly, is outstanding. As well as delivering the highest 3DMark scores yet (in both 2001SE and 2003 versions), it handles Far Cry (one of the most advanced 3D games currently available) with ease. At a resolution of 1,024x768 and with all Far Cry's game engine options set to maximum detail, it delivers an excellent average frame rate of around 40 frames per second.

In terms of pure number-crunching poke, it'll blow any Pentium M-powered notebook into the weeds. Decoding a high definition video file



The Inspiron 9100 has a unique combination of features including DVI video-out, the latest P4 processor and a subwoofer. Unfortunately, it's also uniquely enormous.



Given the huge amount of extra real estate, it's surprising that Dell hasn't experimented at all with the input mechanism.

without stuttering or dropping frames often isn't possible even with the fastest 1.7GHz Pentium M processor, but the 9100's 3.2GHz Pentium 4 CPU manages it with a mere 50 per cent CPU load. If that weren't enough, the 15.4in widescreen display outdoes all but the most expensive desktop monitors thanks to a colossal native resolution of 1,920x1,200. It all runs cool and quiet to boot.

That's the good news, so brace yourself for the bad. Impressive as that WUXGA display may be, it's actually not as stunningly sharp as similar panels that we've seen on Dell's Inspiron 8600 notebooks, thanks to an excessively coarse anti-glare coating that gives the screen a slightly blurry, sparkly appearance.

Likewise, while we like the idea of a subwoofer to beef up sound quality, in practice it's ineffectual; Toshiba's 5200 series, for one, does it much better. We're also underwhelmed by the inclusion of just three USB ports and a single PC card slot on such a large notebook. Surely there's space for a bit of variety on there. As for battery life, there's not even enough juice to complete a single cycle of MobileMark so we couldn't extract a score. In general use, you'll be lucky to get as far as an hour-and-a-half.



The two-inch thick back panel provides plenty of room, so we'd like more than the usual USB/ FireWire combination.

By far the biggest disappointment however, is build quality. It's frankly ghastly. The chassis is fashioned from deeply uninspiring and cheap feeling plastic and the keyboard is ill-fitting and entirely devoid of tactile merit. Aesthetically, it's functional at best.

But here's the real rub. Those ungainly proportions are entirely unnecessary. After all, plenty of other notebooks are available with desktop CPUs. Similarly, several significantly slimmer systems, such as the VooDoo M:860, also offer the Radeon 9700 Mobility graphics chipset.

Still, if it's the last word in laptop performance you're after, this Dell certainly delivers. But let's just hope it isn't the first in a long line of thick-as-a-brick notebooks.

Jeremy Laird

PCPlus ratings

DELL INSPIRON 9100

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	7

NAS APPLIANCE

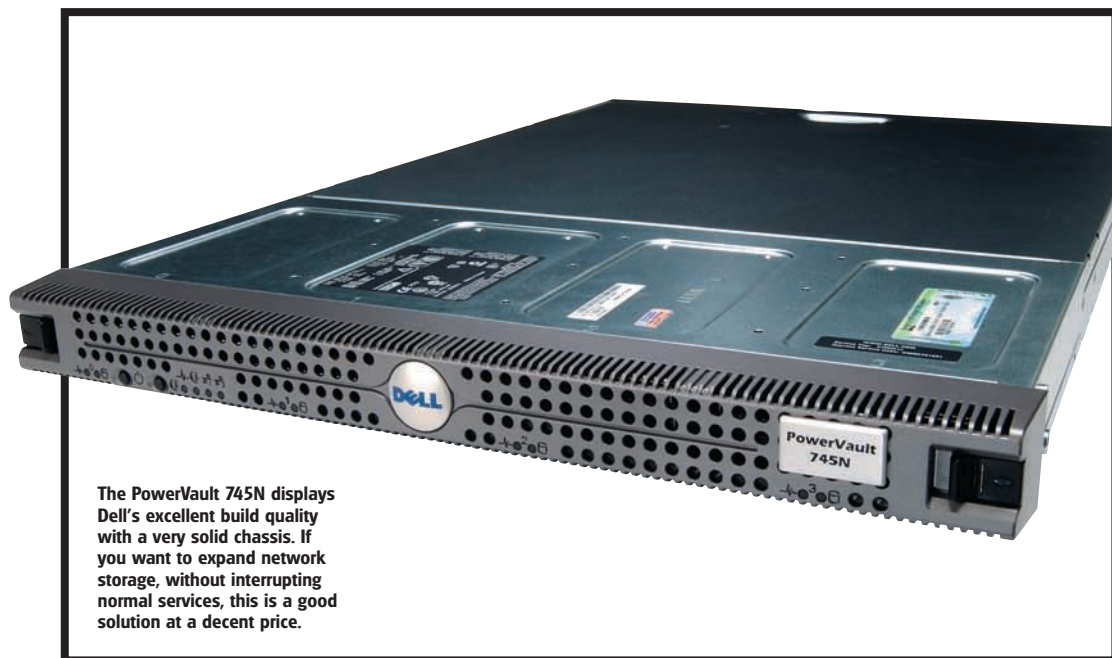
Dell PowerVault 745N

INFORMATION

PRICE £2,550 (£2,170 ex VAT)
SUPPLIER Dell 0870 907 4155
INFO www.dell.co.uk
WARRANTY Three years on-site

SPECIFICATIONS

CPU Intel Celeron 2.4GHz
RAM 512MB PC3200 ECC SDRAM
HDD 4x 250GB Maxtor MaXLine Plus SATA/150
HDD CONTROLLER Dual ATA/100 Intel GD31244 4-port SATA/150 controller
NETWORK 2x Intel PRO/1000 Gigabit adaptors
OS Windows Storage Server 2003 Standard



The PowerVault 745N displays Dell's excellent build quality with a very solid chassis. If you want to expand network storage, without interrupting normal services, this is a good solution at a decent price.

As we've already seen with Dell's latest entry-level servers, Serial ATA (SATA) is now the top choice of interface for delivering masses of storage at an affordable price. This philosophy also extends to network-attached storage at the SME level, and the PowerVault 745N represents Dell's first NAS appliance based around SATA hard disks.

With room for four hard disks at the front, the 745N delivers on the first of SATA's promises, as the review system came equipped with no less than 1TB of total storage. And with a reasonable asking price it also delivers on the second promise of value. The 745N can be expanded up to a massive 4TB, but you can only do this by installing a SCSI controller card and adding up to two of Dell's 14-disk PowerVault 220 drive enclosures.

At the front are four bays with the SATA drives mounted in sturdy hot-swap carriers. A number of RAID options are available, as the base model comes with a simple four-port SATA daughtercard mounted on the motherboard. This uses an Intel GD31244 PCI-X to SATA chipset which doesn't provide RAID capabilities, so in this configuration you can only implement software-based RAID arrays.

If you want hardware arrays and hot-swap, you'll need to add Dell's optional CERC SATA controller card. This is not a problem, as expansion options for a 1U rack chassis are good. The motherboard has been cut away at the rear, allowing a riser card with two PCI slots to be fitted. You get 64-bit/66MHz

and 32-bit/33MHz slots, and there's also enough room for both to handle half-length cards.

Internally, the 745N resembles Dell's PowerEdge 750 entry-level rack server. The motherboard supports a single Pentium 4 processor located in the centre, and its mighty passive heatsink is covered with a plastic air duct. The price includes 512MB of PC3200 SDRAM memory and the Intel E7210 chipset allows this to be expanded up to a maximum of 4GB. General cooling is handled by a pair of small radial fans, whilst a larger blower fan looks after the processor. High operational noise levels can be a problem with a low-profile chassis, and although we found this to be comparatively low we were advised by some users of the 745N that they found it too noisy to be located in a normal office environment.

Windows power is central to Dell's SME NAS appliances, and the 745N has Windows Storage Server 2003 (SS2003) pre-installed. Introduced last year, SS2003 brings into play a number of useful new features over Windows SAK 2.. Note that it cannot function as a domain controller and is not capable of running large applications such as email servers, but it can handle local back-up and anti-virus utilities.

Installation adheres to the NAS philosophy: simply point a web browser at the appliance for secure remote access over SSL. Storage management tools are good, as you can apply a range of passive or active quotas and all access is controlled with local or domain users and groups.

The Volume Shadow Copy Service (VSS) is a key feature of this OS, which takes up to 512 snapshots of selected volumes and provides fast data restoration in the event of a failure. The VSS for Shared Folders extends this security to users, as 64 snapshots are reserved for this feature. XP systems require the Previous Versions client pack, which is provided on the appliance, whilst Windows 2000 systems need to download the Shadow Copy client from Microsoft.

With these installed, users can access the snapshots and view or restore earlier versions of their own files. All common file sharing protocols are implemented; the 745N supports Windows, Unix, Linux, Mac and NetWare clients, although Shadow Copies can only be accessed through SMB and NFS shares. General hardware monitoring is also a possibility, as Dell's OpenManage Server Administrator provides local and remote access for viewing the status of critical components. You can keep an eye on processor, memory, fans and temperatures and an alerting facility will warn you via email or SNMP trap if any values exceed predefined thresholds.

The PowerVault 745N is a fine product. For the £2,550 price tag you're getting a healthy 1TB of storage and plenty of options for RAID arrays. And with Windows Storage Server 2003 at the helm, its installation is swift, management is easy, and you'll find plenty of tools for strictly controlling user access.

Dave Mitchell

PCPlus ratings

DELL POWERVault 745N

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●

OVERALL 8

3.6GHz PENTIUM 4 560 DESKTOP PC

Evesham Evolution 3 6800

Intel's 915P chipset (reviewed last month) shows promise for the future, but in its current state it merely replaces an already competent chipset. The replacement for the 975P chipset was always going to offer far more from the off, and the 925X chipset that finds its way into this Evesham machine certainly doesn't disappoint. Previously known by its codename of Alderwood, this chipset really does offer a glimpse of the future, with support for DDR2 memory as standard in addition to the AGP-replacing PCI Express.

DDR2 memory is the successor to the current DDR standard, but doesn't actually offer any obvious performance increase over its predecessor (although there are some important behind-the-scenes changes). In an attempt to sidestep potential criticism, Evesham has elected to use faster DDR2 533MHz memory sticks here. In theory, this should equate to an improved memory bandwidth, although in testing we only recorded a throughput of 4,806MB/s, which while fast, isn't stunningly so. The 16x PCI Express slot on this motherboard has been populated by one of the fastest graphics processing units currently in existence. The NVIDIA 6800 Ultra is a powerful piece of engineering, and this PCI-Express version does nothing to dent the reputation of its maker. Packing a cool 256MB of local memory, and enough bells and whistles to run the games and applications that will be emerging over the next year, this is exactly the sort of showcase component that you would expect in a new machine.

You certainly shouldn't have any complaints regarding the graphical prowess of this system, with figures that easily redefine that level by which others will be judged. The DirectX 9 3DMark2003 result of 12,378, for instance, is more than double what you would have expected from previous generation graphics cards. This is also the smoothest we've seen this benchmark operate, with an incredible 68fps in the difficult Mother Nature test. The 3DMark 2001SE score of 21,198 is notably behind the Radeon X800 XT-powered Evesham Axis NForce machine reviewed last issue, but it's hardly a slouch when it comes to the current crop of DirectX 8.1 titles. You can't help wondering how fast this machine would have been had an ATI graphics card been used.

Intel may be moving away from marketing its chips by clock speed only, but for now it's the easiest way



When you're paying this sort of money the 17in screen seems a little on the small side – at least it produces a stunning image.



The inside of the machine is dominated by Nvidia's 6800 Ultra PCI Express graphics card.

to tell which processor is faster than another. And regardless of the name, the 3.6GHz Pentium 4 that can be found in this system is 200MHz faster than its predecessor. The new Prescott core boasts a 1MB cache, so this should be a much quicker machine than anything we've seen previously. Sure enough it packs a serious punch in the SYSMark 2002 benchmark, with a score of 366, made up of an Internet Content Creation score of 499 and an Office Productivity index of 268.

This is, of course, a PC in its own right, and more than a simple showcase for all of these new technologies. If you're looking to buy a super powerful machine, then there should be enough for you here and it's all neatly tucked away too, although the columns of tightly packed cables do make adding further drives

troublesome. There are two of the new PCI Express connectors awaiting suitable cards, while a pair of legacy PCI connectors is also available (the third being obscured by the graphics cards cooling mechanism). Two of the four memory slots are open to further investment and there are plenty of drive

bays vacant if you want to boost the machine's storage offerings. There are three Serial ATA but no IDE connectors free, though, so such an upgrade could be difficult. We're surprised that Evesham hasn't built a RAID array for this machine, but the single 200GB drive should keep most users happy.

The big question is, should you actually spend this sort of money on the Evolution 3 6800 Ultra? If you have no interest in gaming then the answer is an emphatic no – this machine has obviously been designed to appeal to that power-gaming user, and is thus extremely expensive. If, however, gaming is your thing and you want to future-proof your investment (as much as possible) then this packs a jaw-dislocating punch.

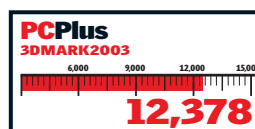
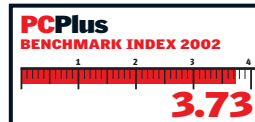
Alan Dexter

INFORMATION

PRICE £1,879 (£1,599 ex VAT)
SUPPLIER Evesham 0870 160 9500
INFO www.evesham.com
WARRANTY Three years

SPECIFICATIONS

CPU 3.6GHz Intel Pentium 4
RAM 1GB DDR2 533MHz
CORE LOGIC Intel 925X
HDD 200GB Western Digital (7200rpm)
DRIVES 8x Sony DVD+-RW, 16x Sony DVD-ROM
GRAPHICS Nvidia GeForce 6800 Ultra PCI Express
SCREEN 17in TFT Viewsonic VP171S
SOUND Onboard Intel 925X
SPEAKERS 2.1 Creative Labs Inspire T7700
COMMS 56K modem, Gigabit Ethernet
PORTS 6x USB 2.0, 2x IEEE1394, FireWire, 1x Parallel, 1x Serial, PS/2 keyboard/mouse, 2x S/PDIF, 5x Audio, 2x DVI, 1x S-Video
OS Windows XP Home Edition
SOFTWARE Pinnacle Instant CD/DVD, Pinnacle Studio 9, BigFix



Labelled an Intel Pentium 4 processor 560 with HT Technology, the fact that it runs at 3.6GHz is all you need to know.

PCPlus ratings

EVESHAM EVOLUTION 3 6800 ULTRA

Value	●●●●●●●●●●●●●●●●
Features	●●●●●●●●●●●●●●●●
Performance	●●●●●●●●●●●●●●●●
OVERALL	8

INFORMATION

PRICE £152 (£129 ex VAT)
SUPPLIER Extensis 01604 636 300
INFO www.extensis.com

REQUIREMENTS

CPU 400MHz Pentium III or equivalent
RAM 256MB
OS Windows 2000 or XP

IN A NUTSHELL

A long-standing, high-end image cataloguing tool that handles both embedded IPTC data and internal database tags via image. It can produce email proofs for clients, burn CDs and create web pages, and is available in a Server version for networked groups.

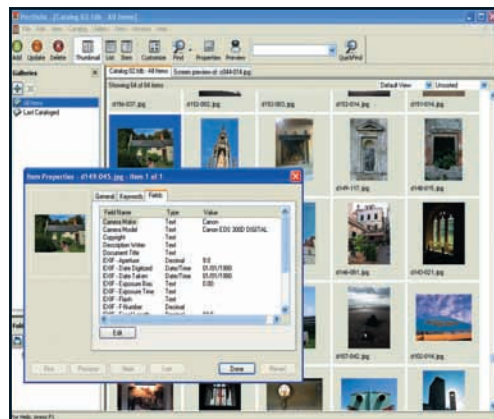
PCPlus ratings

EXTENSIS PORTFOLIO 7

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 8

MEDIA CATALOGUING

Extensis Portfolio 7



Portfolio 7 is a professional-level media cataloguing tool and can be daunting.

import process is particularly powerful. You can assign keywords and other information automatically to images as they import, saving you a great deal of manual tagging later on.

Portfolio 7 is the latest version of Extensis' long-standing professional media cataloguing application. Its approach and tools are almost identical to those of Media Pro 2.5 (reviewed below), although the user-interface and some of the terms used are different.

Portfolio imports image thumbnails from one or more locations into catalog files. You can assign keywords and descriptions to these thumbnail images, and use powerful search tools to find specific photos. Portfolio 7's

also generate medium-resolution preview images, which is especially useful if you're cataloguing offline resources like CDs – you won't need the original CD to display a preview.

The software is geared towards professional users and photographers. You can email low-resolution previews to clients, for example, directly from the application, or burn CDs containing selected images for sending out. You can also generate impressive-looking web-based photo albums automatically from templates. Portfolio's

companion product, Portfolio NetPublish 7, expands on these web publishing options even more.

Like Media Pro, Portfolio can import, search, edit and 'synchronise' IPTC data with the original files. It has an equivalent of Media Pro's catalog 'sets', in the form of 'Categories'. These look and behave like virtual folders, providing a hierarchical tagging structure within the catalog. There's also a Galleries palette that displays the last-imported batch of images, all images or user-defined sets of images.

Portfolio offers a way of working to suit practically any photographer. In doing so, though, it has become a fairly complex program to grasp. Given time, you'll work out which tools suit your workflow, but on balance it's still slightly more daunting than Media Pro, without being significantly more powerful.

On the other hand, it's part of a larger system of related products that make it a somewhat more 'scalable' solution in larger workgroups. This may be enough to tip the balance in its favour. You're best off downloading demo versions of Portfolio 7 and Media Pro 2.5 to see which you prefer.

Rod Lawton

INFORMATION

PRICE £119 (£101 ex VAT)
SUPPLIER iView Multimedia
 0207 223 8691
INFO www.iview-multimedia.com

REQUIREMENTS

CPU Pentium II or equivalent
RAM 128MB
OS Windows 98 or later

IN A NUTSHELL

A powerful media cataloguing application that brings together images stored in different locations into searchable 'catalogs'. It incorporates extensive image cataloguing and tagging tools, and even a quick and effective image/editor tool. It can also generate contact sheets and web albums.

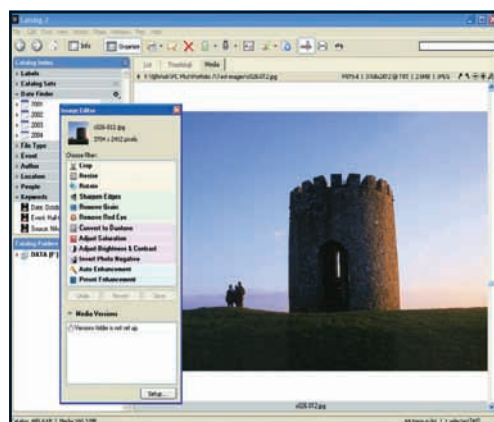
PCPlus ratings

IVIEW MEDIA PRO 2.5

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 8

MEDIA CATALOGUING

iView Media Pro 2.5



Media Pro combines thorough image cataloguing with an efficient and friendly interface, and even a useful image-editor.

database. It stores a thumbnail version of the image together with a link to the location of the full, high-resolution file. Media Pro can also display digital camera EXIF data and image information stored within images

Large media collections need more sophisticated management than simple folder/thumbnail browsers. Imagine pulling together images from all over your hard disk into a single collection, and you'll see where Media Pro 2.5 comes in handy.

Although it can also handle sound files, movies, animations and vector artwork, Media Pro's designed primarily as a photo cataloguing tool. Each 'catalog' you create is stored as a separate file and acts as an image

according to the IPTC standard. This is used by Photoshop (File | File Info) to store keywords, author information and text descriptions within the file itself.

But IPTC information storage is limited, not least because it's difficult to structure information. Media Pro offers its own internal database tools consisting of catalog 'sets', which can be ordered into a hierarchical list. You could have a 'location' set broken down into 'UK', 'France', and so on.

Click on a set name, and the main

window displays all matching thumbnails. You can assign one by dragging it onto a panel in the left of the program window. It's a quick, neat and super-intuitive system.

Its only limitation is for more complex Boolean searches. You can't select two catalog sets to display only images that lie in both, for example. But there is a more sophisticated Boolean 'Find' window that enables multiple search criteria.

Media Pro can also generate contact sheets and web pages. It even has a built-in image-editor that, while it's no Photoshop, can carry out basic tonal and colour enhancements very effectively.

It's expensive compared to consumer-orientated programs like Jasc Paint Shop Photo Album and Photoshop Album, but it's far more sophisticated, not least because it supports multiple databases/catalogs.

If your needs are more modest, you should also take a look at the cut-down version, iView Media 2.5, which sells for just £30.

Rod Lawton

INFORMATION

PRICE £264 (£225 ex VAT)
SUPPLIER Fujitsu Europe
 0208 573 4444
INFO www.fujitsu.com
WARRANTY one year RTB

SPECIFICATIONS

FORMAT Gigamo
CAPACITY 2.3GB
INTERFACE Ultra SCSI
DTR MAX 8.38MB/s
ACCESS TIME 19ms
BUFFER 8MB
SOFTWARE Novadisk+ for NT
 Synchronizable Professional

MAGNETO OPTICAL DRIVE

Fujitsu DynaMO 2300



The Fujitsu MO drive claims to offer the fastest transfer rate in the world at 8MB/s.

external SCSI MO drive but, more importantly, that it's currently the world's fastest magneto-optical drive with a top transfer rate a shade over 8MB/s. Drive installation is literally plug-and-play but note that a SCSI

adaptor card isn't supplied as standard.

The software bundle includes NovaStor's NovaDisk+, which offers backup and restore tools along with a scheduler, virus checking and basic encryption features.

NovaBoot provides disaster recovery as you can create a couple of boot disks and use the latest recovery backup to restore yourself out of trouble. However, this software is now so old as to be an insult and it's debatable whether features such as the non-updateable anti-virus scanner

are of any real value. Of more use is the SecureMO Light28, which provides basic formatting tools but also allows you to password protect each disk plus the bundled Synchronizable software (see below).

To test raw throughput we used the open-source Iometer utility with 100 per cent sequential distribution for 64KB transfer requests. For read operations the drive returned 5.7MB/s while write operations saw a substantial drop to an average of only 1.6MB/s. We confirmed these results by writing a 690MB video file to the MO drive from an Ultra160 SCSI hard disk. This took 460 seconds for an average of 1.5MB/s. Copying it back to the hard disk saw transfer rates for read operations improve to an average of 5.3MB/s.

The 2300 now makes MO a superior performer to entry-level backup tape drives such as Exabyte's VXA-1 and HP's DAT72. If you ignore NovaDisk+ the rest of the software bundle is reasonable but the biggest consideration is, of course, data integrity as MO offers near legendary reliability making it an ideal choice for data archiving and storage.

Dave Mitchell

The proven reliability of magneto-optical (MO) makes it the best choice for long-term data storage and archiving, but nowhere else in the storage industry does development move at such a snail's pace.

Although the latest drive from Fujitsu delivers a 2.3GB capacity on a single 3.5in disk the technology was actually announced by Fujitsu and Sony over three years ago, and Fujitsu released its first model six months later.

The most significant changes are that Fujitsu claims this is its first

PCPlus ratings

FUJITSU DYNAMO 2300

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 7

INFORMATION

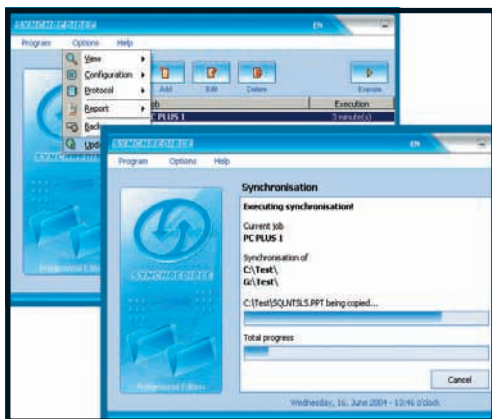
PRICE Bundled with 2300 MO drive
SUPPLIER Ascomp Software
INFO www.ascomp.de

REQUIREMENTS

CPU Pentium or higher
RAM 32MB
OS Windows 95 or later

BACKUP SOFTWARE

Synchronizable Professional



Synchronizable provides simple wizards that help with backup job creation.

for single users with a file limitation of 1GB. The software offered by Fujitsu is the Professional version which also supports a single user but has no file size limitations. It's a simple little tool that uses synchronisation

to ensure that frequent file modifications are picked up.

Installation is a brief affair and the very simple interface belies the range of features underneath. A wizard helps with job creation where you start by choosing folder pairs to be synchronised. Obviously, Fujitsu wants one to be your MO drive but you can select any local drive or network destination as well. You can choose which direction the synchronisation is to occur, decide whether all files or just those that are new or changed should be included and exclude specific file types. The job can be run at a specific time on selected days or after a number of minutes has passed and the job run can be set for as often as every five minutes.

In terms of value Synchronizable doesn't add a great deal to the Fujitsu's MO package as it only costs a few pounds to buy separately. However, it's a very easy product to use, and combined with Fujitsu's DynaMO 2300 MO drive it makes for a back-up solution which is simple and has unbeatable media reliability.

Dave Mitchell

We've rarely been impressed with the software bundled with backup devices and the NovaDisk+ for NT supplied with Fujitsu's DynaMO 2300 (see above) certainly doesn't make us change our minds. It's so old that Fujitsu must have realised it needed something to improve its magneto optical (MO) backup outlook so it decided to pad out its software bundle with Ascomp Software's Synchronizable.

This product is actually available as a free download (www.ascomp.de)

to create backups of selected folders and provides a scheduler to run jobs regularly. It only takes a full back-up the first time a task is run and subsequent jobs compare the data stored on the backup device and only copy files that have been modified or newly created.

Crucially, the Synchronizable Professional isn't capable of mirroring data as it can only run backup jobs at regular intervals. Consequently, the closest you can get to true mirroring is to run the same task at short intervals

PCPlus ratings

SYNCHREDIBLE PROFESSIONAL

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 6

INFORMATION

PRICE £149 (£127 ex VAT)
SUPPLIER www.scan.co.uk
 0870 755 4747
INFO www.gbt-tech.co.uk
WARRANTY One year

SPECIFICATIONS

CPU SUPPORT AMD Athlon 64/FX
CHIPSET nForce3 Ultra
MEMORY 4x DDR DIMM (max 4GB)
EXPANSION 1x AGP 8X, 5x PCI, 2x IEEE1394b, 10/100 Ethernet, Gigabit Ethernet, 2x Ultra ATA 133, 4x Serial ATA RAID, 8 x USB 2.0, PS/2 keyboard, PS/2 mouse, 2x Serial, Parallel, 6x Audio, 2x SPDIF
SIZE 305x244mm

ATHLON 64 ATX MOTHERBOARD

Gigabyte K8NSNXP-939



If you need the extra features and don't mind paying more, this will be a good choice.

and extras. For instance, a total of four Serial ATA connectors are present, thanks to Gigabyte's decision to include a second controller. You'll also find two IEEE1394b ports present, alongside dual

The move to the socket 939 packaging for the Athlon 64 has coincided with the release of the nForce3 and K8T800 Pro chipsets, making this a good time to upgrade your motherboard and processor again. The question is, how do these two chipsets compare in terms of performance and features?

Gigabyte has selected the nForce3 Ultra for the K8NSNXP-939 and as you would expect from a motherboard designed to cover the Athlon 64 FX market, it boasts numerous add-ons

Ethernet controllers (one of which is a Marvel 8001 Gigabit offering). The software-driven ALC850 sound controller is also worthy of note, as it's capable of driving eight-channel audio.

Such features are in addition to the motherboard's core feature set, which includes five PCI slots, two IDE ATA133 connectors, an 8x AGP slot and the full gamut of USB 2.0 ports (eight in total, thanks to the bundled brackets). The nForce3 chipset supports up to 4GB of DDR400 SDRAM, and the four DIMM slots should enable you to upgrade as

you go. The memory throughput of 5,750MB/s is impressive, although we have seen slightly faster performance from other motherboards.

The SYSMark2002 result of 313 is pretty impressive from our test set-up, making this one of the fastest motherboards for AMD chips. The same is true for the 3DMark2001SE and 3DMark2003 tests, producing results of 18,928 and 5,796 respectively. It's all very close though, and choosing between this and the ECS motherboard is going to be a matter of budget first, followed by performance and features.

On the feature front, we still can't understand Gigabyte's reluctance to drop its Dual Power System idea; the benefits are barely tangible, while the addition of another fan to the motherboard will dissuade the more serious system builder. The same goes for the external Serial ATA pass-through drive kit; does anyone actually have a use for this?

If you need even half of the features offered by this motherboard, and don't mind paying the extra cost for those that you don't use, this is a fine choice.

Alan Dexter

PCPlus ratings

GIGABYTE K8NSNXP-939

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

INFORMATION

PRICE £82 (£69 ex VAT)
SUPPLIER www.protac.uk.com
 0870 120 5370
INFO www.ecs.uk.com
WARRANTY One year

ATHLON 64 ATX MOTHERBOARD

ECS KV2 Extreme



The KV2 is a tempting option if you're looking for an affordable board for your Athlon 64.

K8V800 chipset has acquired a Pro moniker, and a few tweaks that will appeal to the overclocking fraternity (the AGP and PCI buses can now be tweaked separately to the processor FSB and the memory clocks).

Gigabyte's motherboard may cover one end of the Athlon 64/FX spectrum, but it does leave a substantial gap for more affordable options. The ECS KV2 Extreme is a real 'hole-filling' contender, with its respectable feature list and 'enthusiast' package at nearly half the price of the nForce3 Ultra motherboard.

ECS has passed on the opportunity to put Nvidia's new chipset to the test, instead siding with the former leader in this market, VIA. Its recently revamped

In theory, there shouldn't be much difference between this motherboard and the Gigabyte offering when it comes to memory throughput, as the dual-channel controller is part of the actual processor. Sure enough, in testing there's little here to separate the motherboards, with the KV2 Extreme measuring 5,759MB/s. The AGP interface is also fairly predefined and combined with this solid memory performance you're looking at almost identical 3DMark2001SE and 2003 results.

If you want to build a machine that will see a fair amount of gaming action, the money you save buying this affordable motherboard could mean you have more to spend on the graphics card. The SYSMark2002 result of 299 is confusing, though, as this is notably slower than the immediate competition. While not slow enough to make this a downright bad option, it will probably dissuade those looking to put together an all-round performance system.

The KV2 Extreme actually has a lot going for it, with two IEEE1394 ports, four Serial ATA RAID channels, dual Ethernet controllers (with another outing for the Marvel 8001), and impressive eight-channel digital audio. The inclusion of a front panel converter that enables you to mount the FireWire and USB 2.0 PCI plate in the front of your machine is a clever idea. The Top Hat Flash chip is also noteworthy (for resurrecting your system easily).

If you're looking for an affordable motherboard for your Athlon 64, the KV2 Extreme is a tempting option. It's not the fastest, but in most other respects, it's spot-on.

Alan Dexter



PCPlus ratings

ECS KV2 EXTREME

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

INFORMATION

PRICE £2,256 (£1,920 ex VAT)**SUPPLIER** Hewlett Packard
0845 270 4114**INFO** www.hp.co.uk**WARRANTY** One year on-site
next business day

SPECIFICATIONS

MOTHERBOARD AMD Serenade**CHIPSET** AMD 8111/8131**CPU** 2.2GHz AMD Opteron 248**RAM** 2GB PC2700 ECC SDRAM**HDD** 1x 40GB Seagate

Barracuda ATA/100

NETWORK Dual Broadcom

NetXtreme Gigabit

OTHER IPMI 1.5 BMC with serial
and 10/100BaseTX ports

2.2GHz OPTERON RACK SERVER

HP ProLiant DL145

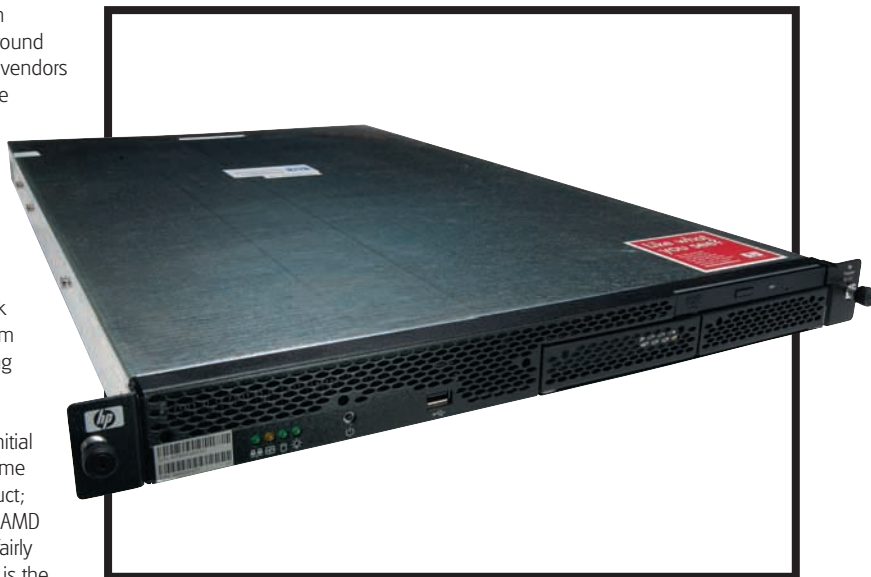
Although AMD's Opteron processor has been around for over a year, server vendors have been reluctant to embrace this technology over Intel's Xeon. Nevertheless, Hewlett Packard makes a tentative move into this market with the release of two rack servers: the ProLiant DL585 and the DL145 on review here.

With its first Intel-based rack servers, HP sourced entirely from third-party manufacturers, giving it a cost-effective entry into the emerging high-density computing arena without the initial manufacturing costs. It's the same now with its first Opteron product; the DL145 is in fact a rebadged AMD A2210 package. AMD has kept fairly quiet about this system, which is the result of its Validated Server Program – a joint effort between itself and manufacturer, Celestica to deliver an Opteron solution to the OEM and system builder marketplace.

Build quality certainly hasn't suffered over HP's own server products, as the DL145 is a sturdy affair enclosed in a solid chassis. There's not much to see at the front, with cooling vents provided for the hard disks, while alongside you find a low-profile 24x CD-ROM drive and a small LED status panel offering basic information about server operations. You also get USB ports front and rear, but these are only the slower 1.1 variety. The lid is easily removed to reveal a very tidy interior.

The AMD Serenade motherboard does come in IDE and Ultra320 SCSI versions, but HP opted to keep costs down by only offering the former model. For the price you get a single 40GB hard disk, but there's room for one more and the secondary IDE interface is cabled up ready to receive it. The drive backplane doesn't offer any hardware RAID or hot-swap capabilities, and the method of linking it to the main board looks a little cumbersome, as a separate board runs down the side of the chassis to make the connection. Cooling is handled by a bank of five fans, and we found the noise levels to be a tad high.

The two processor sockets are located behind the fans and covered in a plastic duct for improved cooling. The price of the system only gets you a single Opteron 248 module running at 2.2GHz, but this is complemented by 2GB of PC2700 memory which can be upgraded to 16GB. Graphics are handled by an ATI Rage XL controller located in a small riser card, while two



The DL145 is HP's first product to enter the Opteron rack server market. But in fact it's a rebadged AMD package – part of its Validated Server Program with Celestica.

Broadcom NetXtreme Gigabit Ethernet adaptors look after the DL145's network connection.

As this product is designed largely for 'HPC' use (high-performance computing), it isn't supplied with many management and monitoring tools. You don't get HP's SmartStart facilities on the supplied CD to help with OS installation, although the network adaptors support PXE (pre-boot execution environment), so an OS image can be downloaded and applied from a deployment server.

As it's probably going into a high-density rack environment, most contact will be via a separate system running HP's Insight Manager software, which provides good access for monitoring critical server components. Local and remote management is possible on the DL145, as it comes equipped with an IPMI (Intelligent Platform Management Interface) 1.5 compliant management controller with its own independent processor. This provides dedicated serial and 10/100BaseTX network ports, allowing the server to be accessed either via a null-modem cable or over the network using a Telnet session.

A basic automatic restart feature is also provided, which implements a watchdog timer routine that's reset at



The ProLiant DL145 is cooled by five fans – unfortunately, they're pretty noisy.

regular intervals during normal server operations. If the server hangs, the timer will continue until it reaches a predefined threshold, after which the BIOS takes over and controls the server. From the BIOS set-up you can decide whether the server should be reset, powered down or rebooted.

With the ProLiant DL145, HP is merely dabbling its toes in the Opteron ocean, although it's clearly taking AMD's alternative seriously enough to offer it as an alternative to its Itanium 2 systems. At the enterprise level, the relative merits of the simultaneous 32- and 64-bit processing supported by Opteron take on a greater importance, and the DL145 offers a cost-effective HPC platform for companies whose investment in 32-bit computing is too great to be ignored.

Dave Mitchell

PCPlus ratings

HEWLETT PACKARD
PROLIANT DL145

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	7

DUAL 3GHz XEON

IBM eServer xSeries 225

Aimed primarily at workgroup applications, the xSeries 225 sits right in the middle of IBM's value range of Intel-based servers. It delivers the company's near-legendary build quality, rack-mount capability and a range of fault-tolerance options.

IBM hasn't changed its chassis design or manufacturing processes for years now, and it's easy to see why: this sleek, black box is built like a tank. There's plenty of room to expand it, as the front panel is home to a couple of 5.25in bays, while a six-disk drive bay lurks underneath. If the asking price seems a bit high, bear in mind that this includes five 36GB SCSI hard disks fitted in sturdy hot-swap carriers. There's good physical security too, as the side panel can be locked shut, which also locks down a metal plate to the side of the storage bay, stopping the hard disks from being removed.

Internally, the server looks a little cluttered, mainly because the large bracing bar which runs the length of the chassis can be awkward to remove. There are plenty of cooling fans, with one hanging off the bracing bar, a pair at the rear of the chassis and a fourth servicing the hard disk bay. Upgrades and maintenance shouldn't take too long, as the tool-free interior has all its components held in place with plastic locking clips.

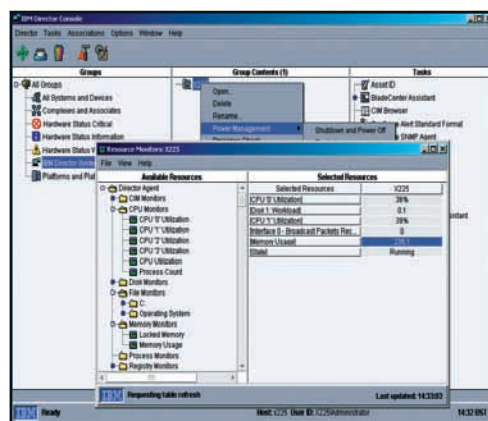
At this level of the server market there's little profit to be had from manufacturing your own motherboards, and IBM adopted MSI as its supplier a few years ago. The server uses an MSI E7505 Master LS-2 motherboard, which is aimed at server applications, but the presence of audio ports and an AGP 8X expansion slot enables it to double up for workstation duties as well. It's looking a little dated now, because you only get a single embedded Gigabit Ethernet adaptor – the majority of new workgroup servers are sporting a pair.

However, one unusual feature is the separate mini-PCI slot in the centre of the board, occupied by an MSI-9513 add-in card with an ATi Rage XL graphics chipset, its external connector wired through to the rear panel. The slot also accepts an MSI 1394 FireWire adaptor card. With total component integration, all PCI slots are free and comprise a single 32-bit slot and four 64-bit, 100MHz slots, with one capable of supporting LSI Logic and Intel ZCR (zero-channel RAID) controllers.

LSI looks after storage with an embedded, dual-channel Ultra320 chipset, and there's more to this than meets the eye: it also supports basic mirrored RAID arrays. It has limitations,



The xSeries 225 offers plenty of room for expansion, good fault-tolerance options, management and monitoring options, plus superb build quality.



IBM's Director provides good server monitoring tools and alerting facilities.

as the drive backplane can only be connected to one of the SCSI channels and each array can only comprise a primary and secondary drive. However, the chipset supports hot-standby drives, so if an array member fails, this gets called into use without interrupting normal services.

Server installation gets off to a flying start with IBM's ServerGuide utility. Supplied on a bootable CD-ROM, it helps set up the hard disks, create a system partition, install drivers and load your chosen operating system. It's a smooth process that can be left largely unattended after the questions have been answered, but it's showing its age by not supporting Windows Server 2003. We chose to create a dual-drive mirror with hot-standby from the BIOS menu, but you can use IBM's ServeRAID utility instead.

IBM's Director is the standard management tool for its servers, blade servers, workstations and laptops, and it requires an agent loaded locally for the system to be remotely managed. This is another utility that looks in need of some graphical refreshment, but it is straightforward enough to use and

provides plenty of information about monitored systems.

You can keep a close eye on critical system components such as processors, memory and cooling fans, and link errors or failures to an impressive selection of event actions including email, network broadcast, SNMP trap and even newsgroup postings.

ServeRAID can monitor the SCSI chipset and arrays from within Windows, and alerting options have been vastly improved to support network broadcasts, email, SNMP traps and sounding an audible alarm.

While some of the eServer xSeries 225's components and software tools are looking in need of an update, it ultimately offers superb specification at a decent price.

Dave Mitchell

INFORMATION

PRICE £3,607 (£3,070 ex VAT)
SUPPLIER IBM 0870 010 2509
INFO www.ibm.co.uk
WARRANTY One year on-site next business day

SPECIFICATIONS

MOTHERBOARD MSI E7505 Master-LS2
CHIPSET Intel E7505
CPU 2x 306GHz Xeon
RAM 1GB PC2100 ECC SDRAM
HDD 5x 36GB IBM 10K Ultra320
HDD CONTROLLERS Dual ATA/100 LSI Logic 53C1010 Ultra320 SCSI chipset
NETWORK Broadcom NetXtreme Gigabit adaptor
OTHER IBM ServerGuide, ServeRAID and Director software bundled



Subtle logos are all that indicate the Xeon power within.

PCPlus ratings

IBM ESERVER XSERIES 225

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

1.2GHZ PENTIUM-M NOTEBOOK PC

IBM ThinkPad X40

IBM's ThinkPad series is one of the world's best-established notebook ranges. Pushed firmly towards a business market, these universally black machines generally forego fancy designs and new technology in favour of solidity and reliability. The X40 retains these core values, while offering a tremendously lightweight chassis for mobile use. You also get a primitive docking station, which adds extra ports, an optical drive and an additional battery.

The features that have marked IBM's laptops out from the crowd have always been software-based. The American giant provides a host of security tools; if you have to lose a notebook, make it an IBM! There's also an effective program for recovering your system after a crash. Perhaps most impressive, though, is the hard drive protection software. This will automatically detect when your laptop has been dropped or waved about, and shut down the HDD, safeguarding the data.

These programs are common to all ThinkPads, though. The X40 needs to impress with its hardware, too. With that in mind, it's disappointing to see an array of year-old components. Admittedly there's no replacement for the i855GME chipset as yet, but it's been around long enough for its excitement value to wane. We're particularly bored of its onboard graphics solution. This has never been up to the task of running 3D games, so we prefer to see manufacturers making the effort to install an independent GPU. In this set-up, the 'Extreme' solution manages a measly 2,299 in 3DMark2001SE.

As we've pointed out, though, the X40 isn't intended to serve gamers; it's a work-focused machine with more pressing concerns. Storage, for one thing, is limited. A 40GB hard drive is now behind the times, especially one that can only manage a random access time of 33.7ms and a 16.5Mbps average read speed in HD Tach. Similarly, it's rare to find a £1,000-plus notebook that doesn't feature a DVD/RW drive these days; the docking station-implanted optical offering here is just a DVD-ROM/CD-RW combo.

It's difficult to criticise a notebook that features both Wi-Fi and Bluetooth for its connectivity. Even so, we are slightly perturbed to find that the 802.11 card installed here is of the b, rather than the faster g, variety. Interestingly, IBM has opted to install this wireless functionality by way of a PCI card, shunning the more common chipset-

BATTERY LIFE
2hr10



Maintaining the long-familiar ThinkPad look and feel, the X40 is light, sturdy and functional, but lacks the flair or power to compete at the top end of the market.



IBM's docking station offers extra ports, an optical drive, and an extended battery.

integrated alternative. If you're handy with a screwdriver, this will enable you to upgrade the technology, but we'd rather have the best kit from the off.

One component that we can't call old-fashioned is the 1.2GHz Pentium-M processor. This low-voltage version of the Banias core appeared three months ago, and we've only seen it in a couple of ultra-portable machines. However, we're not convinced that this chip provides enough power for serious use. This situation is hardly helped by the installation of DDR333 RAM; surely 512MB of DDR400 wouldn't add much to the asking price? Unfortunately, the comprehensive MobileMark2002 performance benchmark failed, perhaps because of all the extraneous software on show. In general use, though, the X40 chugs and churns far more than a £1,500 machine should.

A vital feature of any mobility-focused notebook is its battery life, and here we have few complaints over the X40. A tested lifespan of two hours and 10 minutes, using the battery in the main chassis, puts many ultra-portables to shame. If you need any more time, you can hook it up to the docking station.

IBM also offers an extended battery, which will slightly increase the bulk of your notebook, but takes the lifespan to a quoted 10 hours. If you do choose to upgrade be prepared to pay a fairly hefty fee on top of the usual price.

At just 1.4Kg, the X40 is one of the most mobile notebooks we've come across; only Sony and JVC can beat it on this score. With a more-than-healthy battery life also in its armoury, it really is an excellent traveller. If all you want to do is work on Word documents and Excel spreadsheets, this will do fine. The problem is, if you're only interested in this limited functionality, you shouldn't be looking to pay any more than about £800. The X40 costs almost twice that, and as such should only be considered if your employer is paying for it!

Russell James

INFORMATION

PRICE £1,586 (£1,350 ex VAT)
DELIVERY £8 (£7 ex VAT)
SUPPLIER www.dabs.com
INFO www.ibm.co.uk
WARRANTY Three years parts and labour

SPECIFICATIONS

CPU 1.2GHz Intel Pentium M
RAM 512MB DDR333
CORE LOGIC Intel i855GME
HDD 40GB Hitachi ATA-100 (4,200rpm)
DRIVES Matsushita 16x DVD-ROM/CD-RW (on docking station)
GRAPHICS Intel Extreme 2
SCREEN 12.1in TFT (1,024x768)
SOUND SoundMAX Digital
SPEAKERS 0.5W Stereo
COMMS 802.11b Wi-Fi, Bluetooth, IR, Gigabit Ethernet, 56K Modem
PORTS 2x USB 2.0 (1 with power), PCMCIA Type II, SD Card, VGA-Out, Headphones, Mic, Docking station: 3x USB 2.0, Serial, Parallel, VGA-Out, S-Video
OTHER HARDWARE Docking station
OS Microsoft Windows XP Pro
OTHER SOFTWARE McAfee Norton AntiVirus 2004
SIZE 268x237x24mm
WEIGHT 1.4Kg



Even when closed, this ultra portable chassis measures no more than a couple of centimetres in height.

PCPlus ratings

IBM THINKPAD X40

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL **6**

INFORMATION

PRICE Small business £476 (£405 ex VAT), Professional £1,022 (£870 ex VAT)
SUPPLIER Unipalm 0870 443 2812
INFO www.ipswitch.com

REQUIREMENTS

CPU Pentium or higher
RAM 32MB
OS Windows NT4, 2000, XP or 2003

IN A NUTSHELL

IMail Server is a well-established mail server software product with some useful new tools and enough features to keep small and medium sized businesses happy. It's very easy to use, looks good value and provides a barrage of strong anti-spam measures that includes statistical analysis, phrase filtering and a wide range of black lists.

MAIL SERVER

Ipswitch IMail Server 8.1

Although Ipswitch has always offered a solid range of messaging and network monitoring solutions, IMail Server is without doubt the jewel in its crown. With a history going back as far as 1995, this low-cost mail server has benefited from a steady development program and the latest version delivers a range of new features with spam even higher on Ipswitch's hit list.

The previous version introduced anti-spam measures with statistical and phrase filters; support for RBLs (real-time blackhole lists); white lists of trusted IP addresses and domains; and the ability to verify the sender's mail address. Domains and email addresses that weren't to be trusted could be placed in 'kill lists'. Message searches for specific phrases and HTML filtering could also be implemented.

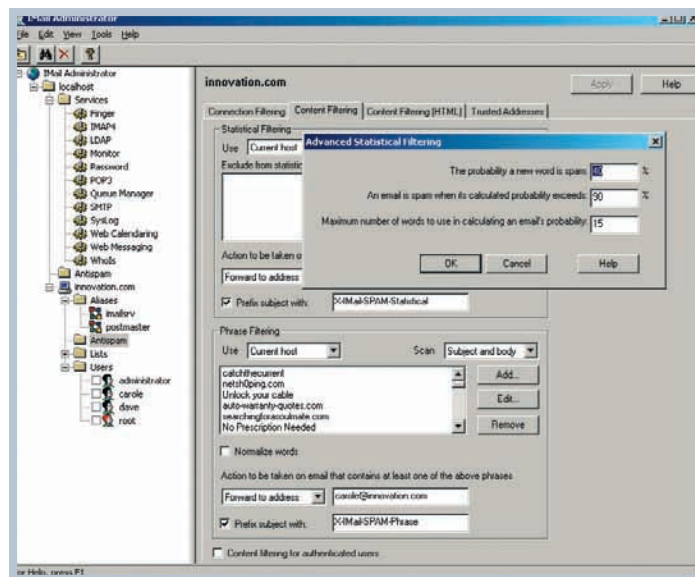
The new features in this version aren't as extensive, but you do get timely support for X-Headers which allow a message ID to be added to the subject line on emails. Messages declared as spam from the content filters can now be moved to another mailbox; the subject line of spam email can be modified by administrators; and you can decide whether to include both the subject and body text in phrase filter searches.

The Small Business version supports unlimited users, five domains and ten mail lists while the Professional version has unlimited access to all

features. We particularly like IMail Server because it's easy to install and we often use it as a foundation for testing other mail filtering products. The process only takes a few minutes and you can choose from an extensive range of messaging services and decide which ones to start automatically.

The administrative interface is well designed with a simple tree structure down one side, where you can quickly check on service status and access the settings for each mail domain. Messages are processed through 13 different stages so it pays to familiarize yourself with these if you want your mail to be routed correctly. Each message is subjected to tests such as SMTP access controls, reverse DNS lookups and connection filters followed by the optional IMail anti-virus scans.

Anti-spam defences start with statistical filtering that compares the content of each message to a special

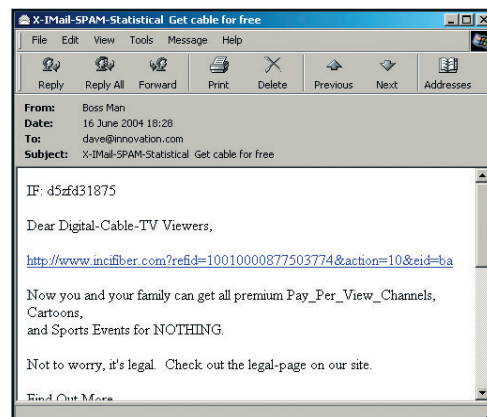


IMail Server's main interface is easy to get to grips with and you get an arsenal of anti-spam weapons. New features include X-Header support, and SMTP access controls.

text file. This contains words with associated scores for determining the spam quality of messages. Phrase filtering checks for commonly used spam phrases and uses another text file. You don't have to create a text file from the ground up as Ipswitch provides some seed files on its website and the bundled Antispamseed utility can also update the statistical tables with more data. If a message fails these tests you can apply a number of actions from forwarding it to another address; dropping it in a special mailbox; inserting an X-Header or just simply deleting it.

Advanced filters

HTML filtering applies a number of tests including checks on embedded comments, deceptive URLs and hyperlinks. You can declare a message to be spam only if a set number of these tests are positive. A URL domain black list can also be applied and, once again, Ipswitch provides a seed list to get you started. User accounts are easily created and plenty of controls can be applied along with user-specific rules that determine how inbound messages are handled. Web access to mail is now a requisite feature for a mail server and Ipswitch's Web Messaging provides this. To set it up

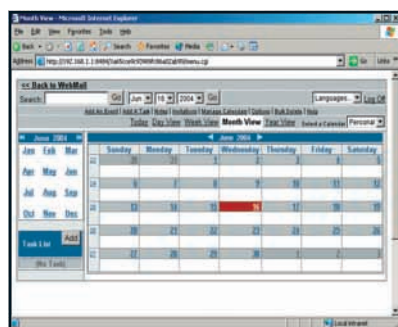


Gotcha – a spam message bites the dust as IMail Server appends it with an X-Header and reroutes it to another address.

you simply start the relevant service at the mail server and decide whether to enforce SSL connections and account lockouts after a number of failed login attempts. The web interface has been modified in this version as the templates provided are designed to be easier to customise. Users will find it simple to use as they are presented with a basic set of tools for viewing their mailbox, composing mail and accessing an address book. Mailbox searches and spell-checkers are provided and the Web Calendaring feature delivers an appointment diary and scheduler.

Although the anti-spam and black lists can be tedious to customise, the new version provides a powerful mail server for the price that has the ability to grow with demand.

Dave Mitchell



Remote users will appreciate the web client interface which has a calendar and organizer.

PCPlus ratings

IPSWITCH IMAIL SERVER 8.1

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

INFORMATION

PRICE £1,599 (£1,361 ex VAT)
SUPPLIER Mesh 0870 046 4747
INFO www.meshcomputers.com
WARRANTY Three years return-to-base

SPECIFICATIONS

CPU 2.2GHz AMD Athlon 64 3500+
RAM 1GB DDR400
CORE LOGIC VIA K8T800 Pro
HDD 250GB Maxtor Serial ATA (7200rpm)
DRIVES 8x Sony DVD±RW, 16x Sony DVD-ROM
GRAPHICS 256MB Nvidia GeForce 6800 GT
SCREEN 19in Sony SDM-S94 TFT
SOUND SoundBlaster Audigy 2 ZS
SPEAKERS 7.1 Creative Labs Inspire T7700
COMMS Gigabit Ethernet, 56K Modem
PORTS 6x USB 2.0, 1x 6-pin FireWire, 2x 4-pin FireWire, Parallel, Serial, PS/2 Keyboard/Mouse, DVI-I, VGA-Out, S-Video
OS Microsoft Windows XP Home Edition
SOFTWARE Pinnacle Instant CD/DVD, Pinnacle Studio 9, BigFix

ATHLON 64 3500+ DESKTOP PC

Mesh Matrix64 3500+ GT

Intel may be launching new chips and chipsets, but for AMD it's business as usual. Athlon 64 processors continue to appear in cheaper and faster guises. AMD isn't having any problems getting chips in mainstream systems either, as this latest offering from Mesh shows.

Peer into this machine and you'll find an Athlon64 3500+ pumping away at a respectable 2.20GHz. It is one of the newer 939-pin models, so this system is slightly more future-proof than the original 754 options, although by the time we finally see a 64-bit version of Windows it's anyone's guess how many pins we'll be playing with.

Mesh has selected the new Asus A8V Deluxe as this system's backbone, which is based around VIA's K8T800 Pro chipset. Asus has thrown all manner of goodies onto the board, including an impressive audio subsystem, which Mesh has completely ignored, preferring to go for the powerhouse that is the SoundBlaster Audigy 2ZS Platinum from Creative Labs. Apart from offering far more impressive sound options, this also adds two SB1394 connectors to the mix, including one that's front-mounted.

The Athlon 64's integrated memory controller has always offered potential, thanks to its reduced latency, but it has never lived up to this promise. It finally looks like Mesh, or Asus, has unlocked this raw power with a pair of Micron 512MB sticks, which produce the fastest memory throughput we've ever seen. The Sandra 2004 SP2 result of 5,950MB/s is good, and is a sure sign that the processor won't be waiting around for the RAM to catch up.

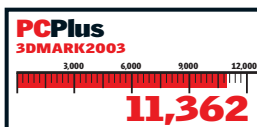
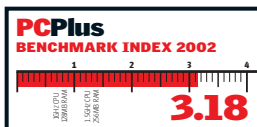
Even with this proficient memory throughput, the Matrix64 3500+ GT

still lags behind those machines based on Intel's processors, at least when it comes to the SYSMark2002 system benchmark (again, we experienced problems running SYSMark2004 – hopefully Bapco will sort out its newest benchmark soon). The result of 312 is notably less than we've seen from other systems, and we've even witnessed 3400+ systems reach 320. Don't be too discouraged by this, though; Mesh's machine is no slouch, and the difference in performance at this level is pretty marginal.

While AMD may lag behind Intel in SYSMark2002, its chips dominate the



Black has been the new beige for some time now, but the Matrix64's sombre tones won't please everyone, and the system chassis is particularly imposing.



The quality speaker set is fed by the powerful Audigy 2ZS sound card, so music and film should sound excellent.

gaming arena. Mesh has married this machine's impressive core to Nvidia's powerful GeForce 6800 GT graphics card. This boasts a faster clock than the standard GeForce 6800, but it isn't quite as break-neck as the 6800 Ultra. Don't be lulled into thinking that this is some kind of compromise, though; it's one of the fastest graphics cards around, something that is borne out by the benchmark tests.

The 3DMark2001SE result of 22,956 is a perfect demonstration of this system's gaming prowess, equating to super-smooth frame rates in all DirectX 8.1 titles. If you're more versed with the newer DX9 test that is 3DMark2003, the score of 11,362 should impress just as much, with the Aquamark3 result of 64.09fps also proving that Mesh doesn't pull its punches.

The rest of the system is what you would expect at this price point, with a quality 19in TFT from Sony and a set of Creative Labs Z1 speakers producing an immersive environment for games, films, and of course, work. The black exterior of these components works reasonably well, but the tower does look far more imposing than most.

Twist the lock at the back of the case, and the side door can be lifted free to gain access to the machine's innards. Unfortunately, it isn't a pretty sight, with cables strewn everywhere and a noticeable lack of cable ties and clips. At least rounded cables have been used where possible, although the cable that connects the soundcard to the front panel will block a fair amount of airflow. This is a tool-free



The Asus motherboard provides a healthy array of ports for external expansion, enabling you to pick your peripherals.

case, though, which makes upgrading later on that bit easier – as long as you can fight your way through the cables...

This is a fully specified machine, but the lack of upgrade potential could be frustrating. Only one PCI slot is accessible by default, and all the external drive bays have been used. There is room for two more Serial ATA drives and twice as much memory, but it feels a little cramped in there already.

Despite these niggles and shortcomings, Mesh has managed to produce a tempting machine in the Matrix64 3500+ GT. It's well priced, packs some nice components and peripherals, and offers serious power. It's not a cutting-edge system, and there are certainly cheaper routes than this, but it's worth considering if your budget can stretch to it.

Alan Dexter

PCPlus ratings

MESH MATRIX64 3500+ GT

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

INFORMATION

PRICE £117 (£100 ex VAT)**SUPPLIER** Morgan Computers
0870 120 4930**INFO** www.morgancomputers.co.uk**WARRANTY** One year

SPECIFICATIONS

CAPACITY 256MB**DISPLAY** 128x64 pixel OLED display**FORMATS** MP3, WMA, WAV**INTERFACE** USB 1.1**FUNCTIONS** MP3/WMA playback, FM radio, voice recorder, clock**CONNECTIONS** Headphone**SIZE** 61x49x16mm**WEIGHT** 48g

MP3 PLAYER

MSI MP3 Mega Player 515



What it lacks in flexibility, it makes up for in longevity.

from it. There's no Flash card expansion slot, for example, limiting storage to the 256MB that comes hard-wired inside it. Transfer speeds are equally limited by an old USB 1.1 connection.

But the 515 is

We don't usually spend much editorial time on flash-based MP3 players. We prefer the bigger, hard disk-based models like Creative's Zen, or multi-function playthings like Thomson's Lyra MP3/MP4 device. But MSI's Mega Player 515 has several features that are worth a closer look.

Best known for its graphics cards and motherboards, the 515 is MSI's first portable audio player. Considering its diminutive dimensions, you'd be forgiven for not expecting too much

more than just an easily pocketable music player. With driver-less plug-and-play connectivity, it can act just like a USB memory stick, double-up as an FM radio and moonlight as a voice recorder, storing speech as WAV files. You can even record FM radio broadcasts.

The highlight, however, is surely the small Organic Light Emitting Diode (OLED) screen, which puts less drain on the battery because it requires no backlight. The 515 also stands out

because it relies on a small Lithium-Ion cell rather than traditional throwaway batteries. Charged via a PC's USB port, the cell can keep the player running for around 15 hours, which is some compensation, considering the limited storage capacity.

Compact and lightweight, the Mega Player 515 benefits from good sound reproduction, while the multi-function approach gives it an edge over other bargain-bucket MP3 players. But the attraction is fleeting. Priced at just over £110, the 515 may be half as cheap and six times smaller than a Zen, but it offers only a fraction of the storage space – and there's no way to expand the capacity. As a portable disk drive, it can be handy, but you'll need to carry around the USB cable at all times to connect it to a PC. The presence of a retractable USB connector would have upped the score by at least a point.

The longer you look, the more flaws you see. Despite its clever use of new technologies, the Mega Player 515 has trouble generating any sort of geeky lust. But in these higher-tech times, we'd be more than happy if one tumbled out of a Christmas cracker.

Dean Evans

PCPlus ratings

MSI MP3
MEGA PLAYER 515

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 7

INFORMATION

PRICE £86 (£73 ex VAT)**SUPPLIER** www.rlsupplies.co.uk
01923 896996**INFO** www.msi.com.tw

SPECIFICATIONS

CAPACITY 1.5GB**INTERFACE** USB 2.0**ROTATIONAL SPEED** 4,200rpm**SIZE** 58x70x13mm**WEIGHT** 56.5g

EXTERNAL STORAGE

MSI Mega Cache 15



It might look good but the Mega Cache 15's specs aren't quite top class.

degrees and provides easy access to any PC's port. The trouble is, the capacity of this device is only 1.5GB. The previous smallest drive ever, Freecom's FHD-XS (reviewed in PC Plus 218), is capable of holding up to 20GB, making it

vastly more useful in the long term. Admittedly it weighs around three times as much, but when you're talking less than 200g, you're unlikely to notice a huge difference.

More notable is the price discrepancy; Freecom's model costs £133 compared to the £86 quoted here. Even so, an extra £50 for more than ten times the storage space isn't a bad deal. We also experienced some problems with the Mega Cache's performance. It failed to complete HD

Tach - the first time that we've ever had that happen - and also performed the rather annoying trick of disappearing from the 'My Computer' menu from time to time, forcing us to unplug and replug it before the machine would recognise it again. These are by no means crippling ailments, and in general use transfer speeds are absolutely fine. Nonetheless, any usability issues are a concern in this plug-and-play age.

The Mega Cache's saving grace is the extras that MSI provides. There are three simple but useful tools: the self-explanatory FD Backup, a mobile email client named Flash Mail and the security-focussed Secure Lock. You also get a handy black carry-case, and an extender lead for the USB connector. These additional elements add value to a product that's already a worthy alternative to the host of popular but vastly over-priced flash memory devices. MSI's problem is that other companies have already beaten it in terms of both performance and capacity. For that reason, we can't really recommend this as a worthy purchase.

Russell James

Another month, another smallest hard drive of all time. We don't want to sound flippant, but HDD sizes have been spiralling downwards for more time than we care to remember, and it's getting to the point where we don't need them to get much smaller.

That's not to discredit this particular model, which is not only tidy, but also relatively attractive. MSI has obviously put a lot of thought into the design, right down to the USB 2.0 connector, which can turn through a full 180

PCPlus ratings

MSI MEGA CACHE 15

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 6

ONLINE MUSIC

Napster 2.5



With Napster, entire tracks and albums can be previewed through streaming.

than to Kazaa. The core purpose of the new Napster is the online sale of downloadable audio files, which are subsequently organised through the software into various libraries and playlists for future

listening. The key difference between Napster and rival applications is the fact that all content can be streamed through the player instantly as part of the £995 monthly subscription cost, although to make them available off-line or on your portable player you'll need to pay to download.

With tracks averaging at 99p and albums at £995, the Napster approach is a little more costly than iTunes, although the choice of music is far superior (at the time of writing). This should balance out over the coming

months if comparisons between the more established US equivalent services are to be assumed.

There is a free 'light' version of the software, although this is obviously functionally reduced and will only enable the purchase of tracks, with costs rising slightly to £1.09 per song. CD burning is still available, as is the option to transfer tracks to your portable player. Support for such portable devices may present a few issues, with its bias towards Rio and Creative units and the Windows WMA format. Apple iPod users, of which there is a growing Windows user base, find no support, which means tracks will need converting to MP3 and transferring manually.

With a large and growing selection of tracks available for immediate playback Napster is back with a vengeance. It may not be quite as unruly and disruptive as before, but it still equips you to discover new music before committing to purchasing. Regular music buyers will find the subscription cost reasonable enough, especially when you think of all those CDs at home that you never play.

Chris Schmidt

INFORMATION

PRICE Free download, £10pcm (£8 ex VAT) subscription, downloads from £1
SUPPLIER Napster
INFO www.napster.co.uk

REQUIREMENTS

CPU Pentium or equivalent
RAM 64MB
OS Windows 2000 or XP

IN A NUTSHELL

Napster has evolved from a P2P application into an audio player with download capabilities. The ability for subscribers to stream entire tracks and albums, rather than rely on predetermined radio stations' expensive downloading, brings a new option to online audio.

PC Plus ratings

NAPSTER 2.5

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

AUDIO PLAYER/ONLINE MUSIC

Apple iTunes 4.6



Online shopping converts the standard audio player interface into a web browser.

through the original bundled software was tricky. Apple came to the rescue by porting its popular Mac audio app, iTunes over to the Windows platform with the 4.5 version. PC users were finally able to drag and drop

tracks directly to their iPod.

The 4.6 update sees little change apart from one small(!) detail – the emergence of the Apple music store and its inevitable availability to a UK market. Proving hugely successful in the US, the feature is guaranteed to wind up the High Street music retailers as punters simply download tracks directly to their computers for a mere 79p a track, or an average cost of £7.99 per album. On the face of it, none of us need ever visit an HMV store again.

In contrast to Napster, there's only a 30-second preview of any given track, and no monthly subscription option. Which service works out to be the cheaper depends entirely on your usage. While Napster is best for people who retain tunes on their desktop, iTunes will benefit those who want to move tracks to external players.

Subscription costs aside, the real factor that may swing things between iTunes and Napster for you is compatibility. iPod users will obviously find that iTunes is more compatible with their hardware, while Napster will present problems with its Windows WMA preference. The largely US-influenced music selection that's currently available via iTunes at present may also dissuade you.

On the plus side, iTunes is free to download, has no running costs other than for downloads and will intelligently convert non-supported formats, such as Napster's preferred WMA, when files are transferred. It's an essential application for Windows/iPod users, but whether you take it shopping is another matter.

Chris Schmidt

INFORMATION

PRICE Free, downloads start at 79p
SUPPLIER Apple
INFO www.apple.com/itunes

REQUIREMENTS

CPU Pentium or equivalent
RAM 64MB
OS Windows 2000 or XP

IN A NUTSHELL

Apple's audio player is an essential tool for iPod-owning Windows users. The core features provide all that you'd expect from an audio player, while the ability to download tracks from the Apple store will save a shopping trip and a CD rip.

PC Plus ratings

APPLE ITUNES 4.6

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	8

Multimedia specialists like Sony must be kicking themselves for not having developed the portable MP3 player earlier. But who would have thought the developers of the Mac could produce the all-dominating iPod? Even with Mac-only support, the player became world famous, and since second-generation players introduced Windows support there's been no stopping Apple's rise.

When early Windows/iPod users found that transferring their audio tracks

PDA

PalmOne Zire 72



For another £110, this stylish, top-quality handheld offers double the features of the 31.

despite the fact that it has a slower 312MHz clockspeed. The PXA270 also features enhanced multimedia (MMX for 3D) and a version of Intel's SpeedStep technology that throttles down the clock to extend

battery life. You may not see big changes on the outside, but the guts of this Zire are all new.

Compared to the Zire 31, paying an extra £100 to get a Zire 72 instead gets you double the memory (32MB, of which 24MB is free), integrated Bluetooth and a sharp 320x320-pixel colour LCD. While the Zire 71 featured a VGA camera with a maximum resolution of 640x480 pixels, the new 72 boasts a 1.2-megapixel CCD. It can capture still photos in resolutions up to 1,280x960 and capture video (direct to

a memory card) in 320x240-pixel .asf files. The quality is decent, although the refresh rate on the LCD can't keep up with rapid movement.

PalmOne has made a few design changes with the 72. There's no sliding cover to hide the 1.2-megapixel camera, and a simpler nav-pad has replaced the 71's mini-joystick. Like the cheaper Zires, there's no cradle supplied as standard. Instead, the 72 is charged directly and synched via a USB cable. With its high-class LCD, you'd expect the battery life to be restricted, but the Intel processor does its best to eke it out. In our tests, this 72 model lasted for over five hours of continuous use.

The Zire 72 delivers some excellent all-round multimedia performance with the ability to organise your life on the side. If IT analysts have foreseen the death of the PDA, PalmOne is making certain that it goes down fighting. Helped by a generous software bundle that includes Documents To Go 6.0 and a new Media application, PalmOne is now producing the sort of stylish handhelds that Sony used to be known for. You can't argue with the quality, but will they sell any better?

Dean Evans

INFORMATION

PRICE £219 (£186 ex VAT)

SUPPLIER PalmOne 0118 974 2700

INFO www-5.palmone.com/uk

WARRANTY One year

SPECIFICATIONS

CPU Intel 312MHz ARM processor (PXA270)

RAM 32MB (24MB free)

DISPLAY 320x320 LCD (65K colour)

CONNECTIVITY IR, Bluetooth, USB, SD/MMC, 3.5mm headphones socket

EXTRA HARDWARE 1.2-megapixel camera (fixed focus), voice memo

OS Palm 5.2.8

EXTRA SOFTWARE PalmOne Media, Handmark Solitaire, Palm Reader, VersaMail 2.7, powerOne Calculator, Documents To Go 6.0 Standard Edition, Acrobat Reader, WebPro 3.5, Messages

SIZE 116x75x17mm

WEIGHT 136g

PCPlus ratings

PALMONE ZIRE 72

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 9

PDA

PalmOne Zire 31



The Zire 31 might just give the flagging PDA market the sort of kick up the arse it needs.

lacks an expansion slot, omits wireless of any sort, and doesn't have the power (or the storage space) to cope with digital audio or video. The Zire 31 takes the next technological step up. With a metallic blue faceplate, the key

addition is the 160x160-pixel colour LCD. It makes the display a little grainy, but it's fine for viewing still images via the supplied Photos application, and it copes well with videos (encoded to 160x160) run through the Kinoma Player.

You have to look harder to find the other improvements. Where the 21 had only 8MB of RAM, the 31 has double this amount, and includes a SD/MMC expansion slot so you can boost it further. Alongside the card slot, there's also a 3.5mm headphones jack, which

is ideal for listening to MP3 tracks via the RealOne Player software supplied on the CD. These extras give the Zire 31 some much-needed multimedia might, making it an attractive prospect for the first-time PDA buyer. There's no wireless, of course, but as the card slot is SDIO compatible, don't rule it out completely.

It would be ludicrous to expect much more from the Zire 31. The 200MHz ARM processor is fast enough to crank along music and video, while the traditional Calendar, Contacts and Note Pad applications will hardly push it. Like the other Zires in the range, the focus on low prices means that there's no cradle supplied. A mini USB port is located on the device's left-hand edge for a direct PC connection.

In tests, the battery life lasted for just over four hours of continued action. But for sporadic look-up-the-odd-phone-number usage, PalmOne claims the rechargeable cell will last for up to a week. The Zire 31 is a versatile device considering its low power and £100 price point – the SD/MMC slot is arguably its best feature. This could be what the PDA market is crying out for.

Dean Evans

INFORMATION

PRICE £109 (£93 ex VAT)

SUPPLIER PalmOne 0118 974 2700

INFO www-5.palmone.com/uk

WARRANTY One year

SPECIFICATIONS

CPU Intel 200MHz ARM processor

RAM 16MB (14MB free)

DISPLAY 160x160 LCD (65K colour)

CONNECTIVITY USB, IR, SD/MMC slot, 3.5mm headphones socket

EXTRA HARDWARE None

OS Palm 5.2.8

EXTRA SOFTWARE RealOne Player, AudiblePlayer, Palm Reader, powerOne Calculator, Handmark Solitaire, Handmark MobileDB, Handmark PDA Money

SIZE 114x74x17mm

WEIGHT 116g

PCPlus ratings

PALMONE ZIRE 31

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

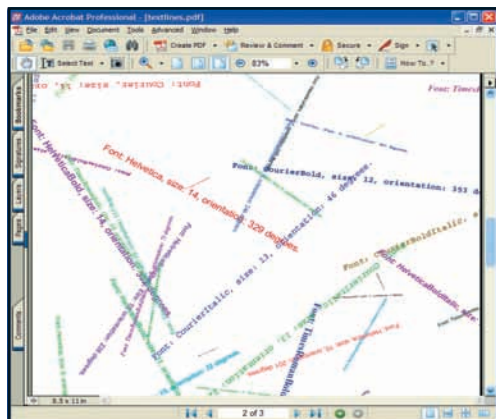
OVERALL 8

With Sony quitting the handheld business, you'd be forgiven for thinking that the PDA is on its last legs. But PalmOne has a point to prove, and down at the cheap and cheerful end of the market the new Zire 31 boosts the spec of the solid, but basic Zire 21.

Swing by the Palm Store and you can pick up a Zire 21 – 8MB RAM, 160x160 monochrome LCD, OS 5.2.1 – for £75, or less if you shop around via the price comparison engines. But the 21 is a low-end, frill-free package that

.NET OBJECT LIBRARY

PDF4NET 2.5.0.0



The library's numerous sample programs demonstrate its advanced capabilities.

up specialised intellectual property and you want to watermark PDF files generated on your server to discourage piracy. If these ideas appeal to you, PDF4NET could be just the ticket.

In essence, it's a 400KB .NET assembly (200KB, if you're using the slightly less feature-rich Compact Framework Edition that's free with the standard product). The PDF4NET library is based around a very similar programming model to GDI+, which makes it easy and intuitive to use. For example, to create a new PDF document you could simply make a call to the 'PDFDocument' class constructor. You would then add a new page by calling the new object's 'AddPage' method, which returns a page reference. Once you've got a

page, you can access the Canvas property of the page using familiar method names (DrawText, DrawLine, DrawRectangle and so on) to render content into the document.

One of the nicest capabilities of PDF4NET is the ability to easily work with and augment existing documents. Another overloaded constructor of PDFDocument takes an existing document name as argument. You can then add new content on top of the old. This makes it a doddle for a server to dish up personalised documents. Other high-end features include the ability to extract pages from one document and include them in another, 40/128-bit encryption, and document and image compression. Two compiled HTML help files are included, one being a how-to guide with numerous samples, the other acting as a class reference to the library contents. You'll find assorted samples on the Web, including some that can be executed online. PDF4NET is written entirely in C# and is entirely managed code – no additional OCX files or DLLs are required, neither is Adobe Acrobat and it's entirely royalty free.

Dave Jewell

INFORMATION

PRICE £275 (VAT N/A) Price includes 90 days support subscription.
SUPPLIER O2 Solutions SRL
 sales@o2sol.com
INFO www.o2sol.com

REQUIREMENTS

CPU Pentium or equivalent
RAM 4MB
OS Windows 98 or later

There are all sorts of good reasons for being able to generate PDF files within your own applications. The Adobe Acrobat PDF format is platform-neutral, so it can be viewed on a wide variety of different operating systems. In addition, the files are relatively compact and incorporate features such as document security.

In the simplest case, you might want to generate an electronic, PDF-based invoice when a purchase is made from your website. Alternatively, maybe you're in the business of serving

400KB .NET assembly (200KB, if you're using the slightly less feature-rich Compact Framework Edition that's free with the standard product). The PDF4NET library is based around a very similar programming model to GDI+, which makes it easy and intuitive to use. For example, to create a new PDF document you could simply make a call to the 'PDFDocument' class constructor. You would then add a new page by calling the new object's 'AddPage' method, which returns a page reference. Once you've got a

PCPlus ratings

PDF4NET 2.5.0.0

Value	●●●●●●●●
Features	●●●●●●●●
Performance	●●●●●●●●
OVERALL	8

NAVIGATION CONTROL

XtraNavBar 2.0.2



INFORMATION

PRICE £54 (VAT N/A)
SUPPLIER Developer Express Inc
INFO www.devexpress.com

REQUIREMENTS

CPU Pentium or equivalent
RAM 32MB
OS Windows 98 or later



XtraNavBar creates a diverse range of visual styles and user interface paradigms, which you can use in your own .NET applications.

by setting the 'GroupStyle' property of a group to 'ControlContainer', you can place other WinForms controls within the client area of the group. Thus, if you wanted to host a tree-view control within a group tab, it would be extremely easy to set up.

A sophisticated design-time property editor is included and (as with earlier versions) you can load and save complex layouts as XML files. Run-time customisation is also possible, enabling the end user to further customise the appearance of the finished application. One of the most interesting features of the new XtraNavBar is the ability to exactly emulate the user interface of Microsoft's latest Outlook 2003 software. This provides large group tabs with a graduated colour background and individual icons for each group. There's also a special 'Overflow Panel' displayed at the bottom, which provide one-click

access to additional invisible groups and a pop-up menu for configuring which buttons are displayed. If you want the latest, trendy user interface and don't happen to work for Microsoft, XtraNavBar is the way to go.

Developer Express is always improving the quality of its product documentation and help tutorials. Accordingly, XtraNavBar 2.0.2 includes a variety of sample projects with pre-built binaries for those in a real hurry. One new feature is the inclusion of a number of Flash tutorials that walk you through the various processes of creating new groups, setting up icons, assigning event handlers and so forth. As with all Developer Express .NET components, full source code is included. Perhaps the only real criticism of this otherwise excellent product is the conspicuous absence of comments in the source; it looks as if they've been ripped out with an automatic comment stripper. This obviously makes the source less accessible than it ought to be. Otherwise, XtraNavBar is a terrific little .NET control at a very reasonable price.

Dave Jewell

PCPlus ratings

XTRANAVBAR 2.0.2

Value	●●●●●●●●
Features	●●●●●●●●
Performance	●●●●●●●●
OVERALL	9

It's around two years since we reviewed XtraNavBar 1.0 from Developer Express. During that time, this little control has become even more powerful. In essence, XtraNavBar is organised as a two-level navigational control. You define one or more groups, each of which can contain any number of items; think of it as being similar to the snazzy Windows XP Control Panel in Category View mode.

This sounds pretty straightforward, but XtraNavBar makes it possible to implement user interfaces that are far more complex than this. For example,

INFORMATION

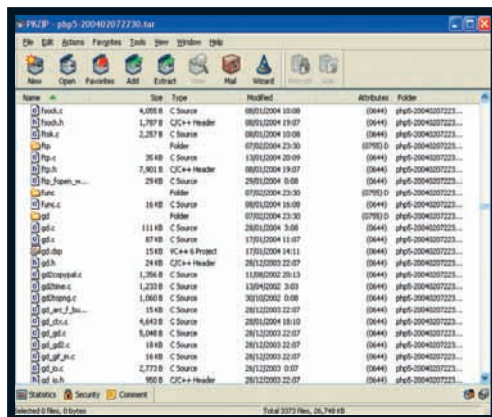
PRICE £94 (£80 ex VAT)
SUPPLIER PKWare 0118 979 9909
INFO www.pkware.com

REQUIREMENTS

CPU Pentium or equivalent
RAM 128MB
OS Windows or later.
OTHER [Email functionality requires Outlook 2000 or later, or Lotus Notes R5.0.8]

DATA SECURITY/COMPRESSION

PKWare SecureZip 8



SecureZip 8's interface is indistinguishable from that of WinZip or WinRAR.

Institute of Science and Technology, has been deemed as seriously flawed by cryptographers. So, the ball has fallen to PKWare, and its response is SecureZip v8 for Windows.

This program is in effect an enhanced

The PKWare product line has gone from strength to strength. This is partly because WinZip's unchallenged dominance of the Windows zip market is starting to crumble, and partly because PKWare has become a forward-looking company, aiming to secure the enterprise.

The battle for supremacy is centred around the ability to securely encrypt zip files, and WinZip has already made a mistake: its implementation of the Advanced Encryption Standard (AES), recommended by the US National

version of PKZip. The common belief is that SecureZip adds AES encryption and other security, while PKZip is just for compression – that's not true. PKZip has full support for all the same encryption as SecureZip. The differences between the two are slim, but still important for large companies: SecureZip can be used within a trusted community of users by way of a certificate server. It's designed to ease communication between internal (trusted) and external (untrusted) users without sacrificing security, and it

comes with enterprise-level support, so there's someone to help you out if there's a problem.

Beyond that, SecureZip and PKZip are pretty much identical, which is a good thing: they both have excellent support for 256-bit AES encryption, allow filename encryption to mask potentially sensitive data from prying eyes, can automatically run virus scans on files as they are extracted, and integrate neatly into Microsoft Outlook. It's a smart move by PKWare to separate the two products this way, as otherwise home users are simply paying for functionality they're never going to use. The company has also made the intelligent decision to use RSA's proven technology to implement its security, which is as good a stamp of protection as you're likely to find.

As one cryptographer put it, "Cryptography is hard, and simply using AES in a product does not magically make it secure." This was the mistake that WinZip made, but fortunately for PKWare's customers, SecureZip 8 really is as secure as promised, and it can provide your business with the extra security it needs in the Internet age.

Paul Hudson

PCPlus ratings

PKWARE SECUREZIP 8

Value: ●●●●●●●●●●

Features: ●●●●●●●●●●

Performance: ●●●●●●●●●●

OVERALL: 8

INFORMATION

PRICE £22 (VAT N/A)
SUPPLIER www.techsmith.com
 +1 517 381 2300 (USA)
INFO www.techsmith.com

REQUIREMENTS

CPU 90MHz Pentium or equivalent
RAM 16MB
OS Windows 98 or later

SCREEN CAPTURE

TechSmith Snagit 7.1



The profiles cover common captures; the Settings provide more specific control.

Snagit provides all the options you'll need via a simple tabbed approach. Initial capture options enable you to choose from various preset common configurations, such as capturing an object (an embedded

capture configurations as profiles, this provides invaluable flexibility.

However, using the software as a mere capture application would barely scratch the surface of its potential. The Edit tab provides access to the Editor, from where you can add arrows, text and callouts to your grabbed images. You can then head into the Studio, which provides annotation options and the ability to save work within projects for future use. The Batch Convert option will apply many common effects such as borders, watermarks and dropshadows from a single point.

The final Organise tab takes things even further, with tools that cover basic asset management and web page creation. The Printer Capture option is another useful feature, equipping the program to spot anything that must be fully rendered when sent to print.

Snagit is an essential utility for anyone who's discovered the limitations of the default OS capture methods. Considering the huge range of tools it provides, £22 is superb value for money. Do you really need that Print Screen key any more?

Chris Schmidt

You may wonder why you'd need a software application to take snapshots of your desktop. After all, your keyboard's Print Screen button does exactly that. However, anyone who needs to make regular use of such an option will realise the limitations of the OS method. For a start, it has problems recognising relationships between a primary application window and its related dialog box, and is incapable of capturing any mouse interaction.

image, for example), user-defined region, application window or entire screen. The Scrolling Window option will be particularly useful for anyone who has tried to grab a lengthy web page that extends beyond the boundaries of the screen resolution.

All forms of capture can be set to convert images, text, video or web page content, for output options that include direct to file, printer, clipboard or even instant messaging. Together with the ability to save your own particular

PCPlus ratings

TECHSMITH SNAGIT 7.1

Value: ●●●●●●●●●●

Features: ●●●●●●●●●●

Performance: ●●●●●●●●●●

OVERALL: 9

RE-WRITEABLE DVD DRIVE

Plextor PX-712SA



The first SATA DVD-burner – and you won't have to use a single, fat, ugly IDE cable.

cable. It also means there's no faffing around with master and slave settings, that cause of so many restarts, and fiddling with tiny jumpers on IDE drives. Just plug the Plextor into a SATA cable and power

supply and, all being well, the BIOS and Windows (2000 and XP are supported) will simply detect it and be happy.

Plextor does warn that some motherboards won't like it at all, but we tried the drive on three different PCs and the only problem we encountered was trying to install Windows XP from a bootdisc – it needed motherboard SATA RAID drivers or it crashed.

Apart from that issue it worked like a dream, with Windows XP completely unconcerned that the drive was using a different interface.

We've all suffered for too long under the tyranny of IDE's hideous, oversized ribbon cables, blocking airflow and annoying case modders. Well now, with the PX-712SA, Plextor has decided that optical drives should get in on the SATA thin-cable action too, and hence has debuted the first SATA DVD-burner.

If you're building a PCI Express/DDR2 system, this is the final icing on the cake for a truly legacy-free PC. Stick a SATA hard drive in there too, and you won't need to use a single, fat, ugly, IDE

Of course, the extra bandwidth of SATA offers precisely no benefit for a drive with a 16x read speed that's able to burn a maximum of 4.7GB, so aside from convenience and having the latest kit, there's no real reason to buy this over the IDE model. What's far more important about the Plextor, is that it's also the first 12x DVD-burner we've used, and this makes a profound difference over the legions of 8x drives currently out there. While those offer average 4.7GB burn times of nine to ten minutes, this clocked in an impressive six minutes and four seconds – all of a sudden, CD burning doesn't look like it's that far ahead in the speed stakes anymore. DVD writing becomes convenient at last.

Annoyingly, while the Plextor is dual format, 12x burning is limited to DVD+Rs, but at least the drive's able to burn some 8x media at 12x speed. What's more of a shame is that there's no dual-layer support in this drive at all. DVD+R DL may be painfully slow at the moment, but it's unquestionably the 'Next Big Thing' in DVD burning, and it's odd for such an otherwise forward-looking drive to omit it.

Alec Meer

INFORMATION

PRICE £120 (£102 ex VAT)
SUPPLIER www.dabs.com
INFO www.plextor.com
WARRANTY Two years

SPECIFICATIONS

FORMATS DVD+R, DVD-R, DVD+RW, DVD-RW, DVD-ROM, CD-R, CD-RW
WRITE SPEEDS 12x (DVD+R), 8x (DVD-R), 4x (DVD+/-RW), 48x (CD-R) 24x (CD-RW)
CONNECTION Serial ATA, internal

PCPlus ratings

PLEXTOR PX-712SA

Value	●●●●●●●●●●●●
Features	●●●●●●●●●●●●
Performance	●●●●●●●●●●●●
OVERALL	8

RE-WRITEABLE DVD DRIVE

Sony DRU-700A



Average performance, hefty price tag, but you can change the colour of the face plates.

This, as it turns out, swings wildly between completely average and slightly lacklustre. It's capable of burning dual-layer DVD+Rs at 2.4x, just like the Lite-On and NEC drives reviewed last issue, which gives it an 8.5GB

burn time of 45 minutes and four seconds – more or less identical to the Lite-On, but a couple of minutes slower than the cheaper NEC.

Forewarned with the knowledge that 4x and faster drives are mere months away, it's hard to stomach the amount of time it takes to burn a complete dual-layer disc, especially when the 12x single-layer burners starting to crop up can burn two 4.7GB discs (more data than one dual-layer disc) in only 12 minutes. As with the

other dual-layer drives we've tested, dual-layer media burned in this one can currently be read by only a handful of other DVD drives and DVD players, but this a problem currently inherent to all dual-layer drives, not just the Sony.

A more specific problem is this drive's unhappiness with some single-layer media. Despite it being an 8x, dual-format drive, it would burn a Verbatim 8x +R disc at only 4x, so clearly a firmware update is needed in the near future. We also had an issue with read speeds; this is rated as a 12x DVD-reader, but our benchmarks produced transfer rates noticeably below this is not catastrophic, but if you regularly transfer data from disc to hard drive, a single-layer burner with a 16x read speed would be the wiser investment right now.

All of this pales into insignificance alongside the mega-thorn in our all-too-wounded side: the DRU-700A is almost twice the price of rival drives from NEC, Lite-On, LG and more, and there's nothing about it that justifies asking this much of a premium – not even those changeable fascias.

Alec Meer

INFORMATION

PRICE £117 (£99 ex VAT)
SUPPLIER www.ebuyer.com
 0870 467 0753
INFO www.sonymstyle.com
WARRANTY One year

SPECIFICATIONS

FORMATS DVD+R DL, DVD+R, DVD-R, DVD+RW, DVD-RW, CD-R, CD-RW
WRITE SPEEDS 40x (CD), 8x (DVD-R), 8x (DVD+R), 2.4x (DVD+R DL), 24x (CD-RW), 4x (DVD-RW), 4x (DVD+RW)
CONNECTION Internal ATAPI/IDE

PCPlus ratings

SONY DRU-700A

Value	●●●●●●●●●●●●
Features	●●●●●●●●●●●●
Performance	●●●●●●●●●●●●
OVERALL	6

It says something when the most interesting feature of a drive that's one of the earliest examples of a new technology, is that it comes with changeable face plates. In this age of obsessively customised system building, having the capacity to choose the colour of the front of your optical drive is oddly compelling. Translucent white or black? We just can't decide. It shouldn't matter of course, because we serious, sober types should think only of the drive's performance.

INFORMATION

PRICE £201 (£171 ex VAT)
SUPPLIER Sonic 020 7437 1100
INFO www.sonic.com

REQUIREMENTS

CPU 800MHz Pentium III
RAM 128MB
OS Windows XP

IN A NUTSHELL

A mid-level DVD authoring application that provides many of the essential features found in more advanced titles via a simplified approach. A refreshing change from more basic, consumer, wizard-based titles, although professional users will find limitations.

DVD AUTHORIZING

Sonic DVDIt! 5



The templates provide a useful starting point when creating new disc projects.

the creative professional edging into this new territory. The software sports an intuitive interface based around tabs that allow progressive configuration of a DVD project. Many base considerations, such as defining

As DVD audiences rise and VHS becomes increasingly obsolete, it's inevitable that we should see a growth in the number of applications catering for this relatively new medium. DVDIt! is from Sonic, which has been developing authoring systems since 1986, originally for CD-ROM. Its latest upgrade positions this software between its own consumer-based title, MyDVD, and the more professional-level ReelDVD applications.

As a mid-level application, DVDIt! is aimed at the ambitious home user or

whether your project will use the US NTSC or European PAL formats, are established in the early 'Project Definition' stage, before you move into the Edit mode to introduce assets that your DVD will rely on.

Such assets can be dragged and dropped into place and previewed with full control over video and audio timelines. You also get the ability to add and name chapter points. The Author tab subsequently provides options for creating the menu interface, with easily recognisable options for

combining the text and graphic elements, subpictures and links necessary to complete the project. Finally, you can preview and burn your project via the Finish tab.

But what can existing users expect from the new version? Menu editing finds various additions that range from template enhancements to motion menus, while buttons benefit from improved customisation. The timeline chapter editing is given a more intuitive method for defining frame-accurate key points within the primary video clip, and navigation controls find set and alternate end-actions and manual on-screen button routing.

There's a new Asset Palette window, along with detailed Asset Properties, Project Tree view and advanced transcoding parameters to aid project management. You'll also find additional support for DVD disc, volume and image file creation, as well as new DVD-ROM Hybrid support.

DVDIt! is easy to use, and ideal for those who are taking their first steps into DVD authoring, but want a little more control than is offered by the wizard-based consumer titles.

Chris Schmidt

PCPlus ratings

SONIC DVDIT! 5

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 7

INFORMATION

PRICE £50 (£41 ex VAT)
SUPPLIER Grovedime 01837 861 172
INFO www.call-track.co.uk

REQUIREMENTS

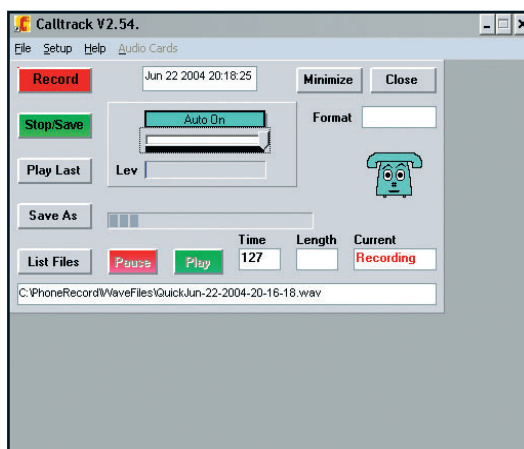
CPU 233MHz Pentium III
RAM 128MB
OS Windows 98 or later

IN A NUTSHELL

Record all your conversations by connecting your telephone to your PC. A combination of software and hardware with an easy-to-use interface, Calltrack also helps the budget-conscious to keep an eye on the length of calls.

PHONE MONITORING

Calltrack



Calltrack looks basic, and lacks a wider degree of functionality.

When you have everything in place, the rather concise instructions recommend that you test it all out to see that it works. To do this, it suggests that you blow into the microphone

Despite the almost universal take-up of email, the telephone still remains a highly useful and essential business tool. Calltrack is an interesting piece of software, and it's so simple that you can only wonder why it hasn't appeared sooner. It consists of a telephone tap that plugs into the microphone port on your PC. Plug the other end into the handset of your phone, and you're all set up to monitor and record your calls.

and see if the software recognises the sound. How well the software picks up your voice will depend to some degree on your soundcard. However, with our motherboard-integrated Intel offering, it really didn't perform very well.

The problem arises because the software doesn't provide you with any way in which to enhance the volume, so you are limited to the hardware settings that you currently have. However, if your hardware does allow

you to register your voice, you can then set about using the software.

One option is to set it to start recording as soon as you or the person at the other end speaks. Depending on the level of sound, you may need to adjust the level at which the software starts to record. This is a handy feature, but one thing that it doesn't do is stop when you end the call. You can only set the software to stop recording after a set period of time. By default, this is set at 20 seconds. But this is one of the parts of the software that can be customised; you can also adjust the format in which the recordings are saved. Unfortunately, this process is far more long-winded than it needs to be.

When recording, we found that while the software managed to pick up what the person at the other end said, our voices were distorted from having to speak so loudly. This is just one of a number of annoyances associated with this program. Although Calltrack is a really useful idea, the software needs some serious improvement before we can recommend it.

Henry Tucker

PCPlus ratings

CALLTRACK

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 5

INFORMATION

PRICE £1,999 (£1,701 ex VAT)
SUPPLIER Sony 020 7365 2947
INFO www.vaio.sony-europe.com
WARRANTY One year

SPECIFICATIONS

CPU 1.1GHz ULV Intel Pentium M
RAM 512MB DDR400
HDD 20GB
DRIVES Sony external DVD/RW
GRAPHICS 64MB Intel Extreme Graphics 2
SCREEN 10.4in TFT LCD (1,024x768)
SOUND SoundMAX Digital
SPEAKERS Mono
COMMS 10/100 Ethernet
PORTS 2x USB 2.0, 1x FireWire, 1x PCMCIA
OTHER HARDWARE External DVD+RW drive, external VGA-out, PCWA-C300S/B 802.11g PCMCIA card, VAIO memory card adaptor (SD/MMC/MS)
OS Windows XP Professional Edition
OTHER SOFTWARE Adobe Photoshop Elements, Adobe Photoshop Album SE, Norton Antivirus 2004, WinDVD, Adobe Premiere, DVGate, SonicStage, MoodLogic
SIZE 256x208x22-9.7mm, 835g
WEIGHT 835g

1.1GHz PENTIUM M NOTEBOOK PC

Sony VAIO X505VP

Photography will never quite do the Sony VAIO X505VP justice. Unless you hold it in the palm of your hand, you can't appreciate how beautifully lightweight it is – 835g is less than the weight of some hardback novels. But what you can see from our shots is the sleek, minimalist design, and how the X505 tapers from 22mm at its tube-like hinge, to a thickness of only 9.7mm at its wedge-shaped front edge. This is easily as futuristic as laptop design currently gets.

With little case-space to work with, the VAIO X505VP relies on an Intel Ultra Low Voltage (ULV) Pentium M processor, which ticks silently along at a speed of 1.1GHz. Alongside it, there's room for a full 512MB of memory, plus an undersized 20GB hard disk drive. On the spec sheet it doesn't sound like a good system, but buying an ultra-lite laptop has always meant making compromises and living with limited connectivity, a smaller screen and significantly less processing oomph.

Unsurprisingly, the X505VP's strikingly slim chassis makes you sacrifice even more. The 1.1GHz chip is capable enough, but the response time is sluggish and you often have to wait one or two seconds while menus load or key Windows applications are nudged reluctantly into life.

It's a shame that the 1.8-inch hard disk drive boasts only a 20GB capacity – half what you'd expect as a minimum specification in a larger

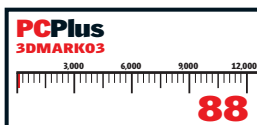
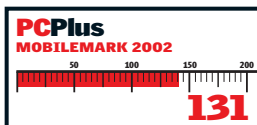
laptop. But for a mobile machine like this, it's good enough for storing emails and Office documents. Thanks to the skinny chassis, there's no room for an integrated optical drive. Instead, Sony supplies an external DVD/RW unit, supporting both +R/RW and -R/RW formats. Usefully, this plugs in via the X505VP's

FireWire/i.LINK connection and, unlike more traditional USB-based drives, the VAIO can power it without the need for a separate AC adaptor.

As far as the graphics are concerned, and remembering that space is tight here, the X505VP makes do with a basic solution. The Intel Extreme Graphics 2 GPU integrated onto the 855GM board isn't renowned for great all-round performance, and it posts a disappointing 3DMark2001SE score of 1,551. 3DMark2003 offers a sterner test, and the lowly score of 88 only just registers on the PC Plus benchmark scale. However, there's



The X505 measures less than 30mm at its fattest point, slimming down to just under 10mm at the front edge. Weighing in at just 835g, it's as light as you could hope for.



The Sony VAIO X505VP is mobile computing at its most aesthetically pleasing, as is usual with Sony.



Powered by Intel's 1.1GHz ULV Pentium M, the X505 is so quiet you can almost forget that it's switched on.

portable. Admittedly, you'll be more productive with a machine that features greater power, connectivity and an integrated optical drive. The 10.4-inch display may be clear, but it's cramped and limited to a resolution of 1024x768 pixels, the Touchpoint mouse is fiddly to use, while the thin keyboard has all the responsiveness and long-term comfort of a garden paving slab.

If neither this nor the £1,999 price tag bothers you, the X505VP certainly brings the 'wow factor' back to mobile computing. Supplied with its own stylish carry case, there's nothing quite like it. The battery life could be better, and the ability to work for an extra hour would be ideal. But until the limitations of today's Li-Ion and Li-Polymer cell technologies are overcome, it's a niggly you'll just have to live with.

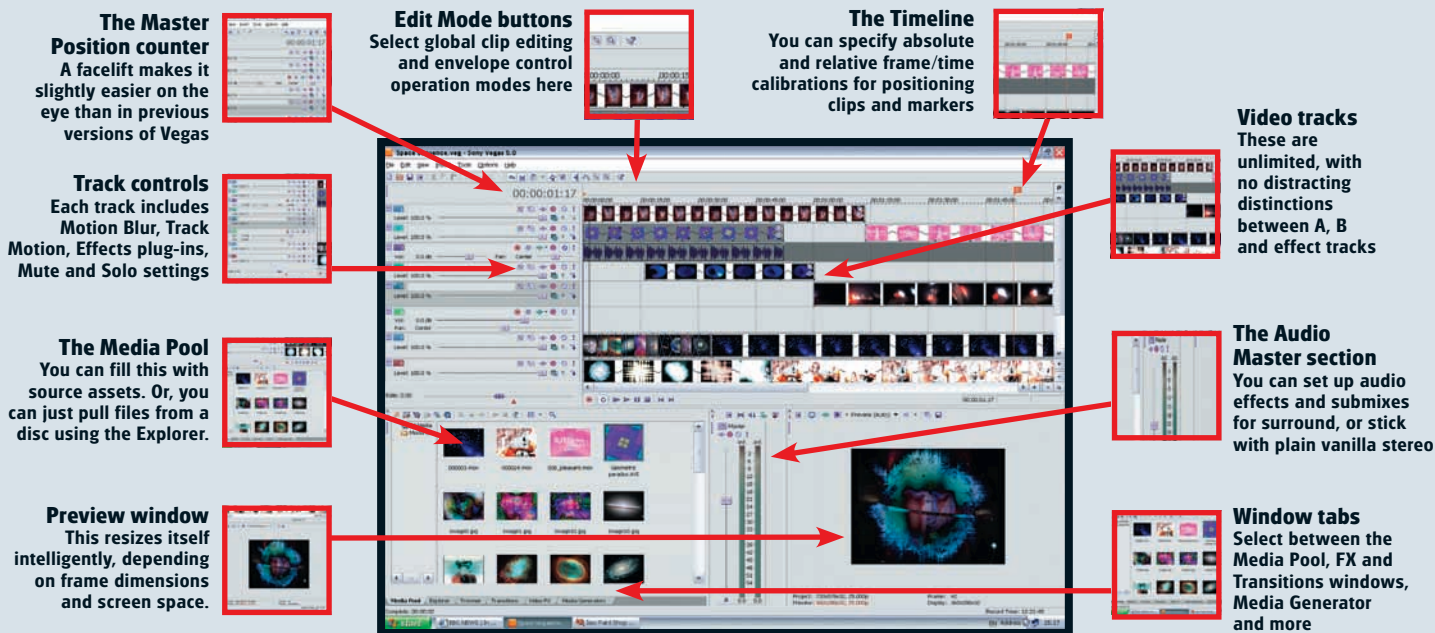
Dean Evans

PCPlus ratings

SONY VAIO X505VP

Value ●●●●●●●●●●
Features ●●●●●●●●●●
Performance ●●●●●●●●●●
OVERALL 7

On the job: the Vegas 5 interface



INFORMATION

PRICE £750 (£638 ex VAT);
SUPPLIER SCV London 020 8418 0778
INFO www.mediasoftware.sony-pictures.com

REQUIREMENTS

CPU 1GHz Pentium 4 or equivalent
RAM 512MB
OS Windows 2000 or XP

VIDEO EDITING / DVD AUTHORIZING

Sony Vegas + DVD Production Suite

The reasons behind last year's Sonic Foundry software clearout remain obscure, but the main item of interest for users of Acid, Vegas, and the CD and DVD Architect products is they've all been sold to Sony. This is good news: the Vegas 5 and DVD Architect 2 releases show that development is continuing.

For those new to the products, Vegas is a mid-level video editor and compositing tool that is a couple of steps above entry-level products like Pinnacle's Studio series, but not quite up with the highest video and film tools used on movies. In other words, it's in a head-to-head with Adobe's Premiere Pro, and looking over the shoulder of After Effects.

DVD Architect (DVDA) is the associated DVD authoring tool, offering most of the features needed to craft a professional-quality DVD production for corporate and small-scale TV use. The previous version of DVDA was one of the first products away from the very high end to offer Dolby AC3 encoding, which of course remains available in this version. Integration between DVDA and Vegas is comprehensive and tight. You can, for example, insert chapter markers within Vegas, and DVD Architect will pick them up automatically.

Five alive

Fans of Vegas won't be disappointed by version 5. The interface has been given a few minor tweaks, but since

good looks have never been a Vegas strong point, the cosmetic changes remain superficial. More importantly, the Vegas core remains unchanged; you get the ease of use and fantastic editing speed of previous versions.

The biggest change is the addition of 3D functionality for the track positioning tools. You can now swoop tracks into and out of the screen (in a 2D kind of way, of course), and also create true picture-in-picture (PIP) effects. Some of these were previously only available as canned transitions – now you have far greater control.

You also get improved control of transitions. These can now be keyframed using envelopes to create transitions that stutter or even reverse. Since most professional work uses simple fades (you can create these on the Timeline with a simple click-drag), these new transition envelopes are perhaps more of a special effect than a stand-out feature, but they will interest more creative video-makers, especially those working with music videos or producing VJ footage for club use.

A related addition is the ability to record envelope changes in real time. You can use these to control almost any parameter, including effects, transitions, and other track settings. If you have a MIDI video controller with a traditional t-bar, you can waggle away and Vegas will record your movements, respond to them in real time, and play them back later. This kind of fun can

also be had with other controllers, including MIDI keyboards.

The remaining changes are incremental rather than spectacular. Masking has been improved, with Bézier curve support. This makes it simpler, but the process remains manual, with not much of a nod towards automated mask tracking. Flash (SWF) import has been improved, as has the Video Capture tool. These were unreliable in earlier versions, but seem to have stabilised now.

The interface has been given a few tweaks, with saveable effects chains and window sets, and customisable keyboard mapping. The latter is more useful than perhaps it sounds. Aside from the obvious appeal to tweekers, it means that users of dedicated video-friendly QWERTY keyboards with printed key assignments can continue using them with Vegas. It also makes the transition from other products easier.

On the DVD

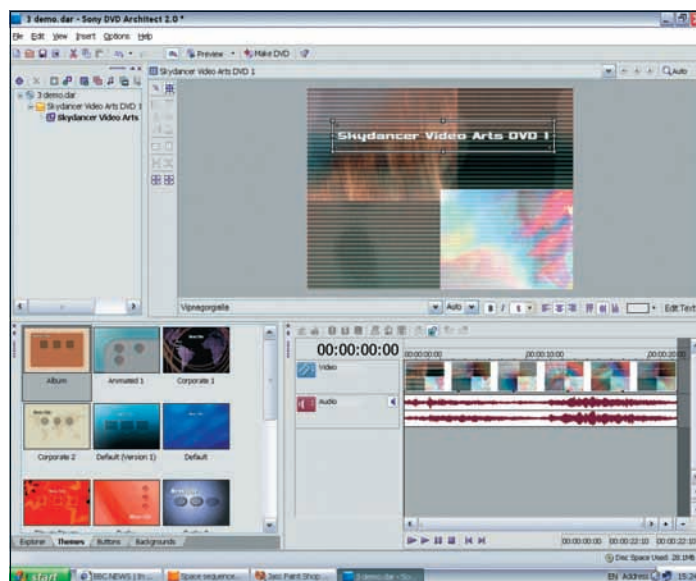
It's much the same story for DVD Architect, with peripheral rather than core changes in this update. More complex program flows are possible by specifying end actions. A video clip will now play another clip, return to a specific menu, loop a number of times and perform other tricks. Many DVD productions are fairly linear, so this is more of an interesting extra than a must-have, but there are always projects where clients ask for

complicated program flows, and now DVDA can deliver them. The link design process has been generally improved, and some of the more inconvenient demands on the user that marred version 1 have been eliminated.

Audio support has been enhanced, with more sophisticated parallel audio options – a useful feature for discs that offer multiple languages. Subtitle support improves on the rather basic functionality of version 1. As with Vegas, Flash support is much better, so you can create animations in Flash and import them directly into a DVD project. Bit budget managers will be impressed by the new optimisation features, which remove some of the guesswork from compression control. A 'fit to disc' feature optimises the latter, so quality is always as good as it can be for a given disc size. It's also possible to take a hands-on approach and control bit rates, frame sizes and other compression settings for each asset.

In the corner

So what's not to like? One sticking point that's preventing a more universal acceptance of Vegas is its lack of support for After Effects plug-ins. The AE plug-in market is vibrant, especially at the broadcast level, and the huge variety of tools available transforms AE from a fairly simple editor into something that's capable of much more. With Vegas, what you buy is what you get, and while what you get is ample for smaller corporate, educational and commercial projects, it lacks the glitz of the creative high ground available to AE users. At the very least, Sony might want to consider opening up the Vegas plug-in format so that third-party designers can make a start on broadening the market.



The improvements in DVD Architect 2 include enhanced audio and Flash support. These help to create a powerful, if complicated program.

DVD Architect, meanwhile, still suffers from some usability issues. It's not a 'clunker' by any means, and the new features make assembling creative projects much easier. But some of the visual layout tools could do with streamlining and tidying, and until this has been done it will interest the semi-pro user, but may not be the first choice for professional authoring houses, even those working at the lower end of the market. Users dipping their toes into this area, especially those interested in putting home videos of junior's first steps onto a DVD to send to the in-laws, will probably find it too much for their needs.

And the winner is

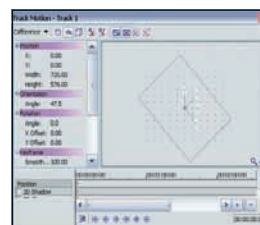
Nit-picking aside, it's hard not to like both Vegas and DVD Architect. The word among professionals is that all but the most die-hard and fanatical users of other packages decide to switch as soon as they try them. Given

the ease of use and the relatively shallow learning curve, it's not hard to see why Vegas remains a good place to start for anyone new to video editing, especially those who are coming from an audio or digital photography background. Many of the skills gained in those areas will be immediately transferable, and this is one package that doesn't force you to learn video concepts that are left-overs from the days of two-deck, tape-based editing suites.

DVD Architect is a more confusing proposition. It faces stiffer competition from the likes of Sonic Solutions and Adobe, and hasn't managed to carve out a strong identity for itself. However, as sold with Vegas as part of the 'Sony Vegas + DVD Production Suite' (see below), the extras in this package really swing the deal. While DVD Architect may not be quite the best of breed, as part of this suite it's easily up to the job.

Richard Wentk

IN A NUTSHELL



Vegas remains a powerful and highly usable video editor, with a wide selection of features and enough real-time responsiveness to make editing easy and fast. DVD Architect offers all of the tools needed to create DVDs for corporate, business and other small-scale presentations. The Vegas + DVD production Suite makes the best of the integration between these tools, and also adds some useful extras in the form of titling, music creation and canned footage. Aside from this bundling and the introduction of 3D video track manipulation, the changes in this update are more incremental than revolutionary.

PCPlus ratings

SONY VEGAS + DVD PRODUCTION SUITE

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 9

The rest of the suite

There's more inside this box than just an editor – you get an array of extras

While some video tools cram in tonnes of useless demo footage of jet skiers and holiday sunsets, the Sony Vegas + DVD Production Suite package, priced at £750 (Vegas on its own is £499), is crammed with juicy extras.

First, there's a set of abstract but useful animated backdrops from Vision. Most of these look rather classy, especially when used as DVD menu backgrounds, and really do add extra gloss and polish to any production.

For audio editing, there's a slimmer, neater version of Acid, supplied with a collection of loops to get you started. Acid isn't up to much as an audio editor, but it's a very inspiring loop and sample

playpen. Most people with even a modicum of musical ability will be able to use this program to staple together customised production music for their video projects.

Also in the box are entry-level versions of the Magic Bullet film-look tool, and the Boris Graffiti effects and titling package. The full version of Magic Bullet sells for as much as the Vegas + DVD Production Package on its own. You don't get all of the features Magic Bullet offers, of course, but you do get a tool that can transform drab miniDV footage into something close to the luminosity and colour depth of real film stock. While this could well be an

advertising ploy to get you to buy the Editor's version of Magic Bullet, available via a prominent link, that doesn't deter from the fact that it's a useful extra in its own right.

Boris Graffiti is a cut-down version of a popular titling and effects processor. The titling in Vegas has been one of its weakest features, and this is a simple and effective way to improve on what's already available. The bad news is that users seem to either love or hate the Boris interface: if you love it, you'll be thrilled with this version; if you hate it, you will appreciate the new features, but are likely to find that titling remains a chore. ■

AUDIO EDITOR/DVD AUTHORIZING

Steinberg Wavelab 5



INFORMATION

PRICE £500 (£425 ex VAT)
SUPPLIER Arbiter Group
 020 8970 1909
INFO www.steinberg.net

REQUIREMENTS

CPU 1GHz (optimised for Intel)
RAM 256MB
OS Windows 2000 or XP

IN A NUTSHELL

With support for surround sound and DVDA, Wavelab has taken itself in a new direction. The core product still offers professional stereo editing and mastering, and will satisfy anyone who wants a step up from more basic tools.

Now that many people have a surround system at home, even if it's only a small set of PC satellite speakers, it should be no surprise that audio-editing tools are being made to match. Steinberg's Wavelab has claimed the high ground since it first appeared six years ago. The price and features are aimed at serious users, spanning the range from dedicated amateurs to professionals.

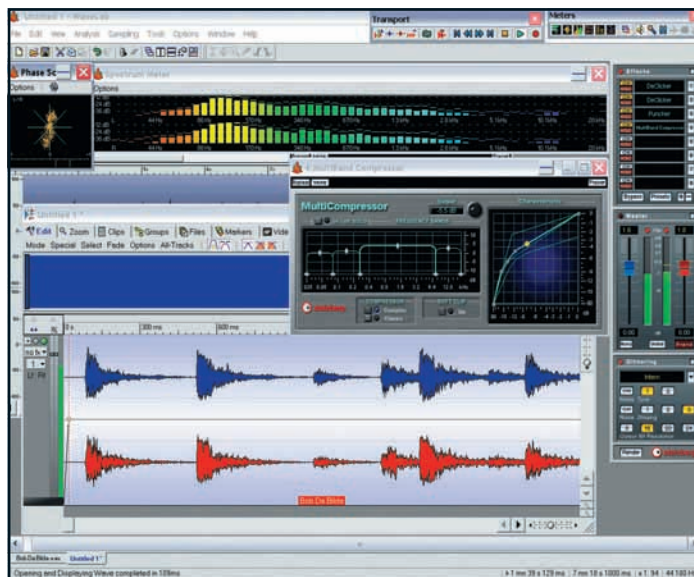
This latest incarnation adds some surround-friendly features. You can now edit projects with up to eight channels, and select from a number of preset surround formats including the standard 5.1. There's full control over how the recorded tracks map to your audio hardware, and Wavelab's excellent visual metering tools have been extended to allow full surround metering. Eight channels of spectral analysis running in real time is quite a sight – this is one area where Wavelab has always excelled, and this update carries on that tradition.

DVDA support is a major part of the upgrade. You can rip from DVDAs, as long as they're not commercial. This will reassure record companies, but disappoint anyone hoping to use Wavelab to create their own ultra-fi DVDA compilations. With your own music there are no such restrictions, and you can create stereo or surround DVDA discs that should play in any commercial player.

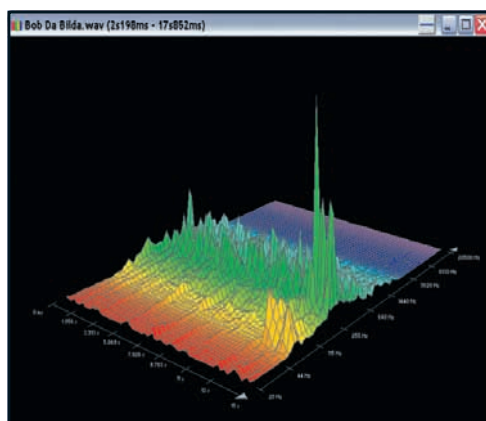
Because of licensing restrictions, there's no support for Meridian's MLP compression technology, which is used to create ultra-fi, high sample rate, commercial DVDAs. Even if professional users buy Meridian's £2,000 MLP encoder plug-in, they still won't be able to use it with Wavelab. Surround audio is limited to a sample rate of 48KHz, but stereo can go up to 192KHz.

A major plus is the inclusion of a menu and slideshow design tool for DVDA, so you can create discs that look as polished as commercial offerings. If your visual skills are up to it, you can achieve a professional result; if they're not, it's just as easy to slap together a set of bare-bones menus.

CD/DVD handling has been extended to allow data disc creation. Until now, you would have needed to run Nero or EasyCD for this kind of work, and it's very useful to have it available here. There's also sketchy DVD video support. You can import a set of DVD video objects as a group and create the audio objects to go with them, before burning the combination to DVD. But it's not immediately clear how valuable this is, because there's no



With so many windows, Wavelab works best across multiple monitors. This is a tool with numerous features, and the learning curve may be too much for non-professionals.



This impressive-looking spectral plot remains a popular hi-tech feature in version 5 of Wavelab.

video editing, and most users will prefer to burn DVDs using more sophisticated tools.

To top off the package, there are a host of small changes, most of which extend file format support to some of the newer audio formats such as WMA, and AES31 for professional users.

On the minus side, the biggest annoyance is the lack of full surround support between the mastering and processing plug-ins. Some tools are surround-friendly, while others, including the popular multi-band mastering compressor, are stereo-only. This is frustrating, if understandable, and it does diminish the usefulness of the new surround features.

It also remains true that the Wavelab workflow doesn't suit everyone. Those in search of a quick and easy compilation tool may find

themselves frustrated by the multiple levels of operation that Wavelab demands. Some streamlining would be welcome here.

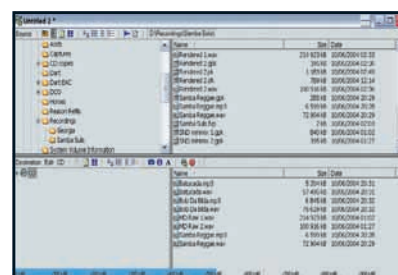
So what's the bottom line? The most important question is how important surround is to you. If you never do anything more complicated than stitch together your

own CD compilations, this fifth version of Wavelab will be overkill.

For casual use, it's a touch too much in terms of features and learning curve. But if you work more seriously with media, perhaps for events management, business presentations, or sound design for games and films, then this upgrade has a lot to offer.

For the first time you can edit, author and burn DVDA presentations in the most popular surround formats, with slideshows, menus, and all the other extras the format can provide. Steinberg's dilemma is that the demand for these features is likely to remain quite limited for the time being. But as the DVDA format becomes more popular, Wavelab will start to look more and more like an ideal solution.

Richard Wentk



The new data CD/DVD features mean that you should never need Nero or EasyCD Creator again, and are a useful extra.

PC Plus ratings

STEINBERG WAVELAB 5

Value ○○○○○○○○

Features ○○○○○○○○

Performance ○○○○○○○○

OVERALL 8

INFORMATION

PRICE £1,291 (£1,099 ex VAT)
DELIVERY £9 (£8 ex VAT)
SUPPLIER Toshiba 0870 444 8944
INFO www.toshiba.co.uk
WARRANTY One year return-to-base

SPECIFICATIONS

CPU 1.7GHz Intel Pentium M
RAM 512MB DDR333
HDD Toshiba 40GB (4,200rpm)
DRIVES 24x CD-RW/DVD-ROM
GRAPHICS Intel 855GME (16-64MB)
SCREEN 15in TFT (1024x768)
SOUND SigMatel C-Major
SPEAKERS Stereo
COMMS 56K modem, 10/100 Ethernet, 802.11g wireless
PORTS 2x USB 2.0, 1x Parallel, 1x VGA, 1x PCMCIA Type II
OS Microsoft Windows XP Professional
OTHER SOFTWARE Microsoft Office OneNote 2003, WinDVD 2000
SIZE 338x274x38mm
WEIGHT 2.6Kg

1.7GHz PENTIUM M NOTEBOOK PC

Toshiba Tecra A2

Hitting the perfect balance between power, versatility and price is something that even the biggest names can have problems getting right. Toshiba didn't manage it with the last of its products to pass through the PC Plus labs – the Tecra M2 reviewed in issue 217 was just too expensive for the kit actually powering the machine. Will the more affordable Tecra A2 be a more popular choice?

The core of the Tecra A2 is similar enough to that of the M2, with both machines being powered by the 1.7GHz spin of Intel's impressive Pentium M series of processors. This processor finds itself amidst the powerful company of Intel's 855 chipset, in this case the 855GME. Not only does this handle the core logic, it is also responsible for the laptop's graphics capabilities. Intel's Extreme 2 graphics core is showing its age now, and while it's capable enough for serious work, if you're interested in 3D or games you're going to find it sorely underpowered. This is demonstrated perfectly by the 3DMark 2001SE result of 2,282, which equates to choppy frame rates and unimpressive features.

Toshiba has married the core of the system with 512MB of DDR333 memory. It has used a single stick of memory, so upgrading later on is easy. The memory is shared with the graphics subsystem, of course, which can be configured to take up to 64MB for its own use, but this still provides enough room for most applications to play around with.

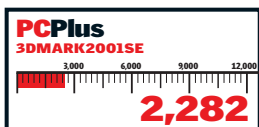
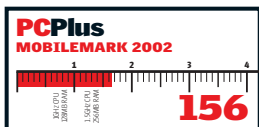
The inclusion of a 40GB hard drive is nothing to get excited about at this price point, where you would normally expect to see an 80GB unit, but again it should be sufficient for most uses. The Tecra A2 does pack a DVD-ROM/CD-RW combo drive,

which enables you to move smaller items around easily enough; although once again when you're spending this much it wouldn't be too outrageous to see a DVD-writer included in the package instead.

When it comes to putting the laptop's core to the test, the overall result in MobileMark 2002 of 156 should be seen as fairly standard. This isn't exactly record-setting for this processor, but it does equate to pretty speedy response times and you shouldn't find yourself waiting around much. Slightly more concerning is the battery life, which rolls in at just under



Nice styling and a thin chassis often come at a cost, and in the case of Toshiba's Tecra A2, the cost to the machine's connectivity is rather off-putting.



We're so used to seeing DVD/RW now that a 24x DVD-ROM is never going to impress us.



The four LEDs on the front bezel of the A2 are attractive, but they're difficult to see when using the machine.

station connector on the underside of the machine, there's not much on the connectivity front – there's no IEEE1394 FireWire connector, no memory card reader, no infra-red port, and there's not even a TV-Out. Style often comes at a cost, but eating so heavily into the connectivity and expansion possibilities of a highly priced system does seem a bit too rich for most tastes.

The Tecra A2 may offer better value for money than some of its siblings, but Toshiba still has work to do in this department – there are much better deals to be had. Of course, if the manufacturer's badge and attractive styling are your prime concerns then you won't be too upset with this, especially if you're happy to pay over the odds for the privilege.

Wendy Green

three hours. Prior to the release of the Centrino chipset this would have been impressive, but now it's actually less than average, with three and a half hours making the norm.

Toshiba has at least managed to set the Tecra A2 apart from the crowd in the style stakes, thanks in no small part to the inherent coolness that comes with using a chassis this thin. The machine's clean lines and attractive colour scheme help to make this a laptop you'll be only too eager to show off, and as it weighs a highly portable 2.6kg there's going to be plenty of opportunity to do that.

A quick tour of the system shows that using such a svelte case does have its downsides, though, notably on the expansion front. The left-hand side of the machine is home to VGA and USB 2.0 ports and the Tecra's sole PCMCIA Type II connector. This is also where you'll find the activation switch for the integrated Intel 802.11g wireless networking. On the other side of the machine, you'll find the volume control and audio jacks, as well as the optical drive, another USB port and the main power connector.

Around the rear of the system is the parallel port, and on the other side of the battery you'll find the modem and network ports. Beyond the docking

PCPlus ratings

TOSHIBA TECRA A2

Value	●●●●●●●●●●
Features	●●●●●●●●●●
Performance	●●●●●●●●●●
OVERALL	7

WIRELESS NETWORKING

TROY PocketPro USB



The PocketPro USB may seem simple to install, but it's a long-winded process.

There are two ways of installing the PocketPro. The first requires you to have a system that has some form of 802.11b on it, which means that you can connect to the PocketPro in an ad hoc fashion and print directly

from your PC. To do this, you simply plug the PocketPro receiver into the USB port of the printer and plug in the power. Having done this, the manual very helpfully suggests that you verify the connection. It doesn't say exactly how this should be done, though. You check that the cables are plugged in and ensure that it's turned on, we assume.

The other way of installing applies if you already have an 802.11b wireless network running. If this is the case, you do the same as with the ad hoc set-up

and plug into the printer's USB port, but also connect it to your access port using an Ethernet cable.

If you chose to do it this way, you can also make use of some of the bundled software. This includes a tool called ExtendView. Once this is installed, you can configure the printer and set up your SSID and any WEP encryption. As well as ExtendView, another handy application you can also install is ExtendNet Connect for TCP/IP, to configure the ports that the printer uses. The bundled software is all useful, but unlike the installation process with most devices, if you don't install all the PocketPro's applications at the same time, each utility has to be selected and installed individually. This makes for a time-consuming and slightly confusing set-up process.

The PocketPro is undoubtedly a good idea, and an attractive one if you have a USB printer that you want to share across multiple PCs. However, it is expensive, laborious to install, and it only works on 802.11b networks. If you really do want to make your USB printer wireless, there are cheaper and easier-to-use alternatives available.

Henry Tucker

INFORMATION

PRICE £168 (£138 ex VAT)

SUPPLIER www.printware.co.uk

INFO www.troygroup.com

WARRANTY Five years

SPECIFICATIONS

TYPE Print adaptor

COMPATIBILITY 802.11b, 10/100 Ethernet

RANGES 100m indoor, 300m outdoor

SECURITY 128-bit, 64-bit WEP

CONNECTIVITY USB 2.0

As those who own USB printers will know, only one PC can be connected and used with them at any one time, unlike printers with Ethernet ports. If you own more than one PC or you simply need to print from multiple machines, this is a real drawback; not many people want to splash out on a network printer. This is where a handy piece of hardware like the PocketPro from TROY comes in. It enables you to turn any USB printer into a wireless network printer so that everyone can use it.

PCPlus ratings

TROY POCKETPRO USB

Value 1 1 1 1 1 1 1 1 1 1

Features 1 1 1 1 1 1 1 1 1 1

Performance 1 1 1 1 1 1 1 1 1 1

OVERALL 4

6MP DIGITAL CAMERA

MINOLTA DiMAGE G600



A good camera for the unambitious, but it may leave you wanting more.

weight (not too big, not too small), and features the Hexanon lens. With its fast F2.8 maximum aperture, this is no bad thing, although some of our shots in low light seemed a little coarse, and the Macro mode was

highly unimpressive.

Controls for the G600 are basic. There are no priority settings, and turning the flash and macro modes on and off are the only things available to occupy your thumb. There are a few more variables, such as ISO speed and picture quality options, but accessing the menu with the small, stiff pad is a tiresome affair. It's made worse by the scrolling layout, which is difficult to navigate compared to a lot of cameras released over the past couple of years.

The last of our complaints is aimed at the battery-cum-memory card slot. The flimsy plastic door looks endangered, and removing the memory cards is a frustrating business, thanks to their placement next to the spring-loaded battery launcher.

However, take into account the G600's speed and all is forgiven. It's ideal for someone graduating from a 35mm snapshot camera to the simple end of the digital photography spectrum. Those six megapixels are a bit gratuitous, though, since there's not a great deal more detail captured than with the cheaper 4MP G400. Still, there's surprisingly little picture noise until you start using the flash, at which point you'll be more concerned with the random nature of the auto white balance to care. This can be fixed with a bit of Photoshop, and under normal circumstances you'll be more than happy with the pictures you get straight off the camera.

The DiMAGE G600 is a convincing example of a well-priced camera for the masses – despite the rather upper class pretensions of its logo.

Adam Oxford

Konica and Minolta. Two mighty giants of photography, recently merged into one to create Konica Minolta. Genius! It's a double-barrelled surname that makes the kit sound impressive, but it really is just a name; the designs of the actual cameras the company is producing are pretty much as they always were.

The DiMAGE G600 is virtually identical to the Konica Revio KD-420, apart from a few design tweaks and a new 6MP sensor. It's the same size and

INFORMATION

PRICE £249 (£212 ex VAT)

SUPPLIER Warehouse Express
01603 25 8012

INFO www.minoltaeurope.com

WARRANTY One year

SPECIFICATIONS

TYPE 6MP compact digital

EFFECTIVE PIXELS Six million

APERTURE F2.8-F4.9

FOCAL RANGE 39-117mm
(35mm equivalent)

ZOOM 3x

STORAGE MEDIA SD, MMC,

Memory Stick

FILE FORMATS JPEG, WAVE

(DPOF-compliant)

DISPLAY 1.5in TFT LCD

INTERFACE USB 1.1

POWER Li-Ion battery

PCPlus ratings

MINOLTA DiMAGE G600

Value 1 1 1 1 1 1 1 1 1 1

Features 1 1 1 1 1 1 1 1 1 1

Performance 1 1 1 1 1 1 1 1 1 1

OVERALL 7

17in LCD MONITOR

Viewsonic VX750



The speakers make the VX750 appear as a widescreen LCD, but it's a 17in display.

The VX750 is both shiny and smart. It's turned out resplendently in silver, with a single power button (complete with blue LED) at the front, and everything else tucked out of sight. The most obvious

departure from the usual LCD design, though, is the pair of large speakers positioned on either side of the panel. It's these puppies that give the monitor its multimedia selling point, boosted as they are by an unusually-whopping 5W of power. They still struggle with heavy bass, but they offer excellent clarity otherwise, and can easily be heard within a desktop environment.

It's equally pleasing to see both a D-Sub and a DVI-I connector on offer. Switching between the two inputs is easy, thanks to a well-designed menu

system that also boasts a healthy range of colour settings. Unfortunately, this menu system also highlights the VX750's main deficiency: both brightness and contrast are set almost to 100 per cent by default. This is fine for word processing, where the image is bright enough, but it leaves little in reserve for darker environments, such as those found in some games. However, picture quality is otherwise excellent, with a high degree of sharpness, good refresh rates, and viewing angles that are far better than the stated figures suggest.

There are a couple of other small annoyances about this display. Manoeuvrability is an issue; it will tilt slightly, but it won't pivot or rotate, and it's decidedly bulky. We're also irritated by the way that it constantly reminds you of the native setting when you run anything at a lower resolution.

On the whole, though, this is a superb offering at a very reasonable price, and gives the excellent Samsung SyncMaster 173p, reviewed last month, a run for its money. Long may this trend for interesting, high-performance monitors continue.

Russell James

INFORMATION

PRICE £349 (£247 ex VAT)

SUPPLIER www.savastore.com
0870 220 0044

INFO www.viewsoniceurope.com/uk

WARRANTY Three years

SPECIFICATIONS

NATIVE RESOLUTION 1,280x1,024dpi

INPUTS D-Sub, DVI-I, Audio-In

VIEWABLE ANGLE 150 degrees

horizontal, 125 degrees vertical

PIXEL PITCH 0.264mm

RESPONSE TIME 16ms

CONTRAST RATIO 400:1

BRIGHTNESS 270cd/m²

WEIGHT 5.6kg

PC Plus ratings

VIEWSONIC VX750

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 8

In the summer time, monitors are fine. Or at least that seems to be the case. Just three months ago, we were moaning about how the only LCD screens that we ever saw were budget models with nothing but a below-par panel to their name. Thankfully, a touch of sunshine has woken manufacturers up to the fact that not everything in life is dull and grey. As a result, we're now seeing a host of screens that are not only attractive, but innovative too – and this latest release from Viewsonic is one of them.

MULTIMEDIA PROJECTOR

InFocus X2



The InFocus X2 improves on the excellent X1 with added brightness.

Faroudja DCDi chipset and four-segment, 2x colour wheel. It makes a similar amount of noise, it has an identical 3,000-hour bulb, and it sits in a casing that requires close scrutiny to spot any differences at all.

Where are the improvements?

However, delving into the release, you'll find that a number of technical specifications have been updated. The brightness has been augmented to 1,600 lumens (or 1,100 lumens in economy mode). This is a big help, as one of the few flaws with the X1 was how it bordered on being too dark.

More worrying 'advancements' include the discarding of the standard VGA port. In its place stands the M1-DA, a dual USB/DVI port which frankly we're

still not keen on; it simply limits your options. There's also a revamped remote control that's not as good as the previous model's (no illuminated buttons or mouse control), and there's no longer a carry case provided.

What does remain, is the excellent image quality. If you consider SVGA to be good enough for business use, the updated X2 will do you proud. As with most DLP projectors, the geometry is flawless and it scales up to 1,024x768 better than most LCD offerings can manage. What's particularly surprising, considering that this is a general-purpose projector, is just how good the X2 is at handling video. Colour is superb and the image quality is excellent, meaning that it will probably be used more for watching films than for any work purpose.

The X2 is a fine successor to the X1; InFocus has quite rightly taken the 'if it ain't broke' stance. The added brightness was much needed, but we're disappointed that InFocus didn't opt for a faster colour wheel, as the slight 'rainbow' effect is the only flaw in otherwise superb video performance.

Neil Mohr

INFORMATION

PRICE £827 (£704 ex VAT)

SUPPLIER www.projectorpoint.co.uk
0800 073 0833

INFO www.infocus.com

WARRANTY Two years

SPECIFICATIONS

SYSTEM DLP

RESOLUTION 800x600

ANSI LUMENS 1,600 (1,100)

CONTRAST RATIO 2,000:1

LAMP LIFE 3,000 hours

NOISE 39dB (37dB eco)

AUDIO 2.5W mono speaker

SIZE 25x33x11cm

WEIGHT 3.1kg

PC Plus ratings

INFOCUS X2

Value ●●●●●●●●●●

Features ●●●●●●●●●●

Performance ●●●●●●●●●●

OVERALL 8

We always had a soft spot for the InFocus X1. Not only was it one of the first projectors to move DLP into the budget-end of the market, it did so with a style and level of performance that belied the cheap price. Two years on, we have the X1's successor, predictably named the X2. So what new features does it offer?

At first glance, very few. The new model looks and feels almost identical to its predecessor. For a start, it uses the same DLP SVGA 800x600 engine,

Guide to your SUPERDISCS

Follow our project-based tutorials in this guide to your cover discs

Welcome to this month's SuperDisc. Exclusives from Paragon and Visualware lead the way...



David Wiltshire
david.wiltshire@futurenet.co.uk

David is responsible for sourcing the best programs each month found on your fantastic SuperDiscs

Upgrading your hard disk drive? Paragon Drive Copy SE makes it easier to transfer everything to your new hard disk. Ever wondered who's behind those attacks on your firewall? Given an IP address, VisualRoute will track back, displaying location and WHOIS results on a world map.

Get the maximum out of your digital photographs with CodedColor PhotoStudio 3.51.1 SE. Continuing the photographic theme, creating immersive 360-degree stitched images is a doddle with Panoweaver 3.01 SE.

With a fully featured image-editing app in the guise of the GIMP, asset management tools from Adobe and Ulead, the popular IrfanView graphics viewer or RedEye (for zapping flash reflections), we're sure you'll find something worth adding to your digital imaging toolkit. Combine all this with SolidCapture and MandrakeMove, plus all the regular sections and you've got another packed line up!

The DVD offers additional content including TaxCalc Lite 2004 and Cooperative Linux. Enjoy!

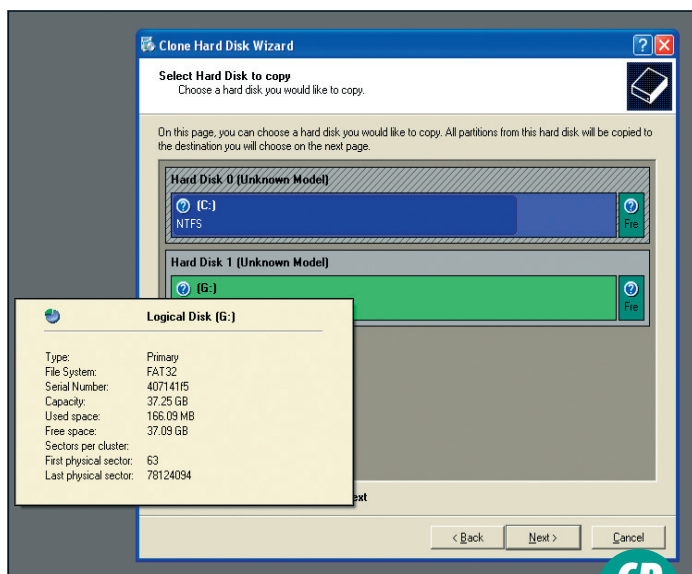
This month's SuperDisc software tutorials

Paragon Drive Copy SE	210
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CodedColor PhotoStudio 3.51 SE	212
VoyagerSoft LLC Solid Capture v1	213
Panoweaver 3.01 SE	214
Freeware Graphics Toolkit	215
MandrakeMove	216

DVD BONUS

Intuit TaxCalc Lite 2004	219
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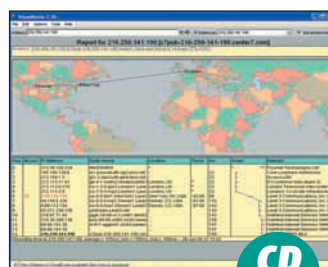
This month's product highlights (also on the DVD)



CD 1

BACK-UP UTILITY Paragon Drive Copy SE

If your hard drive has failed you'll need more than a couple of CD-Rs and a few data files to recover properly. Paragon Drive Copy SE is a handy tool you can use to quickly copy the contents of one hard drive to another and includes a useful Copy Hard Disk Wizard, which will speed up the image-creation process.



CD 1

NETWORK DIAGNOSTICS VisualRoute PE 7.3

Is your firewall constantly bombarded by the same IP address? With Visualware VisualRoute PE, you can employ tracing tools to find out who's behind the attack on your defences.

IMAGE EDITING UTILITY CodedColor PhotoStudio 3.51 SE

Organising your image collection has never been easier and with CodedColor PhotoStudio to hand, you can use a modest set of editing tools to improve your digital shots before storing them in a simple catalogue or album.

CD 2

PhotoStudio also includes a handy author to CD/DVD wizard.

LIVE LINUX DISTRO MandrakeMove

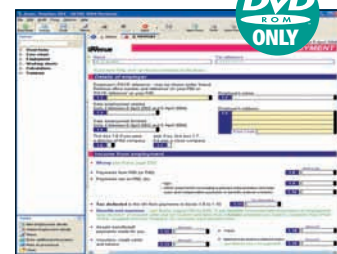
CD 3

If you want to try out a Linux distro without having to install a new OS then try live CD distro, MandrakeMove. It makes for an excellent portable computer package and even includes OpenOffice.org 1.1. The distribution also handily stores all its settings data on a USB key, so that when you reboot, all your settings are saved.

PERSONAL FINANCES Intuit TaxCalc Lite 2004

It's hard to get excited about filling in your tax return, but to make it easier TaxCalc walks you through it on-screen, calculates the final return, then sends it to the Inland Revenue!

DVD ONLY





This month's **PCPlus** Toolkit Digital Imaging – *unleash your creativity!*

CD 2

DVD ONLY



→ **Panoweaver 3.0.1 SE**

Stitch together immersive 360-degree spherical or cubic images into a single skin by simply importing your images



→ **CodedColor PhotoStudio 3.5.1 SE**

View, organise, enhance, share and archive your image library through this single application



→ **Solid Capture v1**

With multiple window and full screen capture at your disposal, Solid Capture provides power and versatility



→ **Freeware specials**

Freeware that will satiate your digital photography desires, whether collecting, presenting or editing is your thing

Your essential resources

Our collection of tools, utilities, archives and other useful goodies to enhance your computing

ON CD 2 AND THE DVD DIGITAL IMAGING TOOLKIT SELECTION

Adobe Photoshop
Album 2
IrfanView 3.91
RedEye 1.5
The Gimp 2.0.2
Ulead Photo Explorer 6.02

FREWARE SELECTION

3D Canvas 6.5.0.5
Ariacom Business
Reports 3.1
Audacity 1.2.1
BEA WebLogic JRockit
SDK 1.4.2_04
CartObjects Lite 1.8.1
ChoiceMail Free 2.52
DbNet 1.0
FileAmigo LE 6.0.5
FolderShare 3618
Mach5 Analyzer Free 4.1.1
MyPhotoWizard 1.4
Natural Voice Text
to Speech Reader Standard 4

NoteTab Light 4.95
PCB123 2.0.0.2865
Resync 1.714
Sceneo Vcopy 1.1.02
Skype 0.98 beta
SolidBlue Win MD5 Sum v1
Startup Inspector for Windows 2.09
Sumation Explorer SE 1.23.282.00
TrackNShare Client 1.03

LINUX SELECTION

Arabesque 2.01
Bluefish 0.13
DEBTS 0.5.3
DownloaderForX 2.50rc3
DSPAM phpControlCenter 1.04
DSPAM 2.10.6
Kdetr 0.8.0
MandrakeMove
OpenOffice.org 1.1

OPEN SOURCE SELECTION

DynAPI
Kguitar
Perl Data Language
PhpShop

ReportLab
Sawfish
SquirrelMail
SynEdit
The Freenet Project
TiK
TurboPower Abbrevia 3.04

ON CD 1 AND THE DVD UTILITIES SELECTION

MySQL 4
PHP 4.3.6
Apache HTTP Server Version 2.0.4.9
Mozilla 1.7
Mozilla Firefox 0.9
Netscape 7.1
Opera 7.51
Adobe Reader 6
RealOne Player 2
Macromedia Flash Player 7.0.14
StuffIt Expander 8

DVD EXTRAS

Cooperative Linux 0.6
PDF Archive for issues 165 – 209

Trial software

DVD ONLY

CD 1

The finest selection of demo and time-limited software

Acronis Disk Director Suite 9
Anti Ghostbusters SE 4.44
BounceBack Express 5.5
ContentVault v1
FinePrint 5.23
INM 2.2
Kaspersky Anti-Hacker 1.5.119
Kaspersky Anti-Virus Personal 5.0.142
pdfFactory Professional 2.23
pdfFactory 2.23
Tourweaver 1.25



SOFTWARE LABS

Adobe GoLive CS
Apache HTTP Server Version 2.0.49
CuteFTP Professional 6
Dreamweaver MX 2004
EasyPHP 1.7
MySQL 4
NetObjects Fusion 8
TopStyle Pro 3.10
WEBSmith 2
WS_FTP Pro 9



Technical Support

Our support staff will do their utmost to help you, but cannot provide assistance for either Linux software, or general application help for hardware, DOS or Windows.

Difficulties with your software?

CONTACT PC PLUS CD AND DVD READER SUPPORT

Email pcplus.support@futurenet.co.uk
Tel **01225 822 743**
Website www.futurenet.com/support

Damaged or missing SuperDisc?

MISSING SUPERDISC If you're a subscriber then please contact our reader support team. Otherwise, please contact the retailer where you purchased this issue.

DAMAGED SUPERDISC If your cover disc appears to be faulty, please call our reader support team.

BACK-UP UTILITY

**FULL PROGRAM
AS SOLD FOR £30**

Paragon Drive Copy SE

Has your hard drive failed? It's a PC disaster, and you'll need more than a couple of CD-Rs and a few data files to recover properly. With this handy tool, you can quickly copy the contents of one hard drive to another, providing a complete in-case-of-emergencies back-up

REQUIREMENTS

Pentium 300MHz or higher, 64MB RAM, Windows 98 or later, two hard drives (internal or external)

SERIAL CODE

Register at <http://registration.paragon.ag/wizards/dc>

UPGRADE

Save 20 per cent

Drive Copy is normally provided as a part of Paragon Partition Manager, which adds extra tools to create, format, resize, merge, undelete, move, copy, and convert partitions without data loss. Normally priced at around £27, you can get an extra 20 per cent discount with our special upgrade deal.

Don't need a partition tool? The same 20 per cent discount is available on Paragon Drive Backup, a flexible application that can back up data to any destination. Or, get a copy of CD-ROM Emulator 3.0, providing up to 23 virtual CD-ROMs, and unlimited virtual CDs, for only £13.

Visit www.paragon.ag to read more about each product. Click 'Buy Now' if you decide to purchase, and enter the coupon code 'Covermount1' to claim your saving. Don't spend long thinking about it, though – this offer expires on 31 August 2004.

www.paragon.ag

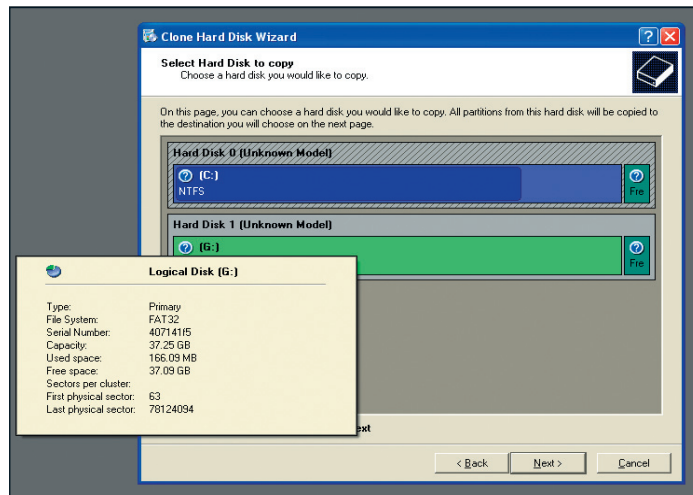
Firstly, Paragon Drive Copy works with complete disk images and hard drives only, so you can't use it to create CD or DVD back-ups. External hard drives will work just fine, though, as long as they're speedy (USB 2.0 or FireWire) and have at least the same capacity as your desktop drive.

1 Order of the boot Producing a drive image under Windows poses difficulties for any back-up tool. What happens if you're halfway through the process, and Windows modifies a file you've already backed up?

Drive Copy reduces the chance of conflicts by restarting your PC, and performing the back-up before you've logged in. It's a sensible move, but may lead to another complication if your PC tries to boot from the external drive.

Will this happen? Try it and see: with your PC turned off, plug in the external drive, switch the power on and Windows should appear. If you're less fortunate, the PC may see your external drive as the first disk and try to boot from it. This won't work, as there's no operating system, so your system will display an error message, then stop. Unplug the drive and turn your PC off.

Restart the system, then load your BIOS set-up program and look for the 'Boot Order' settings (perhaps under a menu called 'Advanced BIOS Options'). The choices depend on your PC, but you need to make sure that your main



Click the drive's blue Help icon to view its capacity, and its used and free space.

drive is first in line to be booted. Your external drive's documentation may have more specific advice to offer.

2 Be prepared Once your PC can reboot with the external drive connected, it's time to prepare for the back-up process. Clean the junk out of your main drive – after all, why waste time copying files you don't need?

Run the Windows Disk Cleanup tool, (click Start/Run and launch cleanmgr.exe), and take the time to remove any applications you no longer need. Use Explorer to manually browse your Program Files and Temp folders (\Documents and Settings\UserName\Local Settings\Temp). It's surprising how much junk uninstallers leave behind – but don't delete anything unless you're sure it's no longer required.

Defragmenting your disk before running Drive Copy isn't as worthwhile. The program produces disk images by working at a lower level, copying disk clusters rather than files, so defragmenting won't offer any performance benefit. Once you've cleared away junk files, close down all programs and launch the Drive Copy tool.

3 Working the wizard

Click Launch Drive Copy to start the Copy Hard Disk wizard. Its first screen displays the drives detected on your system. Click the drive you'd like to copy so it's highlighted, then click Next.

Any remaining drives are displayed on the second screen, where you must choose a destination for the copy. Be careful here; everything on the destination drive will be erased, replaced by the source image. Needless to say, it'll be a bit annoying if you accidentally wipe the wrong disk.

Click Next for a selection of copy options. Press the [Tab] key to cycle through them, and Drive Copy will display a brief description of each setting. We'd recommend accepting the default options, although checking 'Verify writing' may be wise if you have the time (Copying will be much slower, but it'll trap errors that could otherwise cause problems later).

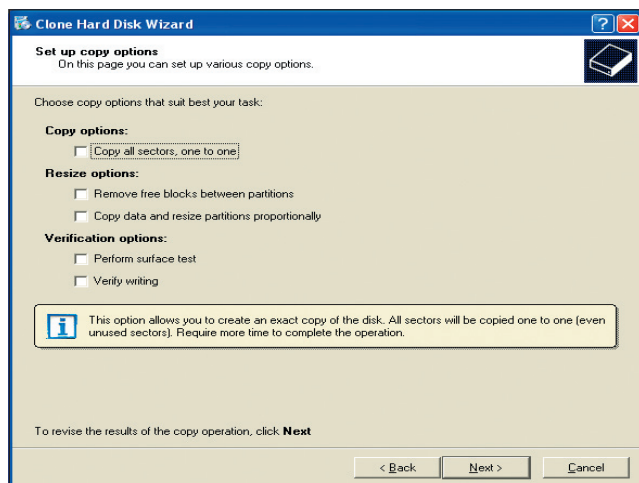
Finished? Then all that's left is to click Next and review your wizard settings. Have you specified the correct source and destination drives? Is the destination drive large enough to hold all your data? Click Back to make any changes if necessary, otherwise select Next, choose to apply your changes, and let the Hard Disk wizard safely back up your drive. **PCP**

SUPPORT AND FURTHER ADVICE



If your PC won't boot from a USB drive, check for drivers from the manufacturer, or visit www.bootdisk.com/usb.htm.

Email SuperDisc problems to pcplus.support@futurenet.co.uk



When using the Copy Hard Disk Wizard, uncheck the 'Copy all sectors' box, and it will only copy used disk sectors, speeding up the image-creation process.

**FULL PROGRAM
AS SOLD FOR £28**

Visualware VisualRoute

Ever wondered who is behind those attacks on your firewall? Given an IP address, VisualRoute Personal Edition 7.3 will track back to its source, displaying location and WHOIS results on a world map. It is also handy for identifying hold-ups in Internet traffic

REQUIREMENTS



Pentium 1GHz, 64MB
RAM, Windows 98
or higher, Sun's
Java 1.1.4 and
above Microsoft's Java
VM build 5.0.0.3167
or later.

SERIAL CODE

[http://secure.
visualware.com/
crm/free/pcplus](http://secure.visualware.com/crm/free/pcplus)

UPGRADE

Save 40 per cent!

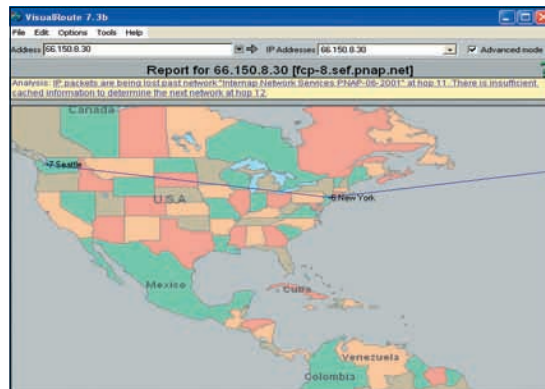
Version 8 of VisualRoute includes a textured physical map option, more tracing features and a new port testing capability. New Help items ensure you'll get the most from the program, while new display options provide a clearer view of each trace. The normal price of VisualRoute 8 is \$4995 (£27), but as a registered owner of the previous version you're entitled to a 40 per cent discount, cutting the upgrade cost to \$2997, or around £17. To order, visit <http://secure.visualware.com/crm/gp/upgrade>, enter the VisualRoute licence key you received by email, then click Upgrade. There's an additional \$10 (around £540) to be saved if you order eMailTrackerPro at the same time. Read more about Visualware's email tracker at the company's website: www.visualware.com

Your firewall probably logs a variety of port scans and apparent intrusion attempts on your PC, every day you're online. One-off attacks can be ignored, but what if you see scans from the same IP address reported, time after time, over a number of days? It may be wise to try and find out who is behind that address, and VisualRoute can help you investigate further.

1 Enter an address Launch VisualRoute and select Edit Licence Key. Enter the key you received in your registration email to unlock the app.

Check Advanced mode¹ on the main screen. A table appears below the world map, which will show a detailed report of VisualRoute's progress. Close down any open browser windows or programs that might make use of your Internet bandwidth. Type the IP address you would like to investigate into the VisualRoute address bar, then press [Enter]. It may take a little while for the program to do its work, so sit back and watch as your report is generated.

2 Read the report VisualRoute uses a TraceRoute utility to find IP addresses. This isn't infallible, and if a host doesn't return VisualRoute's message packets, the location search ends right there. Read the report



VisualRoute
uses a built-in
TraceRoute tool
to track IP
addresses to
their destination,
anywhere in
the world.

analysis (immediately above the world map) for more details on the problem.

Usually, you'll find that VisualRoute identifies the nearest city to the attacker. However, you can zoom in to see this in more detail by left-clicking on the world map (use right-clicks to zoom out again).

For more information on the destination IP address itself, click the name at the bottom of the Network column. This displays the WHOIS records, showing the ISP or company that owns this address. If you're sure that your firewall logs show repeated attacks, look for an 'Abuse' link. Official complaints about hacking attempts can be sent to that email address and, if justified, will get the offenders' accounts closed. **PCP**



A live WHOIS link gives you up-to-date information on the owner of an IP address.

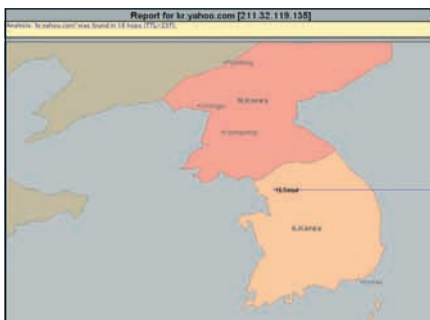
SUPPORT AND FURTHER ADVICE



Understanding tools like TraceRoute and Ping will help you use VisualRoute. Browse a reference site like **www.webopedia.com**.

Email SuperDisc problems to
pcplus.support@futurenet.co.uk

Free Internet traffic reports

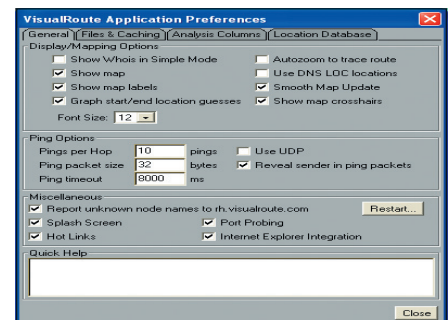


1 Ever wondered why one of your favourite websites seems to be very slow, or can't be reached at all? Enter its URL into VisualRoute and check the map; sites based far away will tend to be slower. The VisualRoute analysis may also report problems with a Web server, that is perhaps not accepting connections to port 80.

Asn	IP Address	Node Name	Location	Time	ms	Graph	Network
9							99 Pknet Technologies Ltd
10	195.106.128.11	nl-pknetnet-pknet-gpi-nl		21	0		Core Linkages Addresses
11	217.113.12.1	gpi-2-wat1-gpi-nl		22	0		Access LAN
12	195.106.128.12	nl-pknetnet-pknet-gpi-nl	London, UK	22	0		EU Institutions (Bank 2)
13	217.113.12.2	gpi-3-wat1-gpi-nl	London, UK	22	0		London - Colgate Infrastructure
14	195.106.128.13	gpi-4-wat1-gpi-nl	London, UK	23	0		2nd London Gateway Infrastructure
15	217.108.131.21	nl-pknetnet-pknet-gpi-nl	London, UK	23	0		SprintNet UK
16	144.222.18.10	spintnet-sp1n-10.sprintnet	Turkmenistan, NA	05:00	126		Sprint SPFIN-NNET
17	144.222.18.13	spintnet-sp1n-15.sprintnet	Persanouskan, NA	05:00	109		Sprint SPFIN-NNET
18	144.222.18.14	spintnet-sp1n-16.sprintnet	Persanouskan, NA	05:00	109		Sprint SPFIN-NNET
19	144.222.18.17	spintnet-sp1n-14.sprintnet	Persanouskan, NA	05:00	93		Sprint SPFIN-NNET
20	144.222.18.10	spintnet-sp1n-10.sprintnet	Stockton, CA	08:00	165		Sprint SPFIN-NNET
21	144.222.18.13	spintnet-sp1n-13.sprintnet		129			Sprint SPFIN-NNET
22	144.222.28.48	spintnet-sp1n-12.sprintnet		128			Sprintnet Asia Pacific Region
23	202.22.18.16	spintnet-sp1n-2.sprintnet		147			Sprintnet Asia Pacific Region
24	210.51.18.1		(China)	08:00	530		China Netcom Corp
25	210.51.132.29		(China)	08:00	544		China Netcom Corp
26	210.51.130.3	spintnet-sp1n-11.sprintnet		488			China Netcom Corp
27	210.51.148.134		(China)	08:00	489		China Netcom Corp
28	202.22.18.16		(China)	08:00	475		China Netcom Corp
29	202.162.165.16	cn-netcom.com		569			Internet content provider

Roundtrip time to cn-netcom.com, average = 569ms, min = 498ms, max = 675ms - 26 Jun '94 13:43:50

2 The report table offers more clues. Lots of intermediate hosts (more than 15), for instance, will slow you down. The graph indicates which hosts have the slowest response times and the widest spread (the difference between the best and worst response time). Click Edit|Snap to save the report you've produced for future reference.



3 Tweaking VisualRoute settings may help it to reach difficult sites. Click Options/Preferences/General, then increase Ping timeout, and the program will wait longer before giving up on a packet. Click Files and Caching, then clear the DNS, RDNS, Whois and Hops caches to force VisualRoute to download new information.

IMAGE UTILITY

FULL PROGRAM

CodedColor PhotoStudio 3.5.1 SE

Taking stock of your digital snapshots is a breeze with this comprehensive image utility. View, organise, enhance, share and archive your growing image library through a single application that does everything you need to keep on top of your collection

REQUIREMENTS

133MHz Pentium, 128MB RAM, Windows 98 or later

SERIAL CODE

Register as a new user via the Registration menu, then complete the necessary form and unlock the software

UPGRADE

Save a third

This Special Edition of CodedColor PhotoStudio provides excellent features, but for faster searching, batch conversion of image folders, enhanced web conversion, and extended compression methods (including self-extracting archives and contact-sheet printing), you may want to consider moving up to the more fully-featured Pro version. When you register online for the free Special Edition version, using the Registration menu, you'll be given the option of choosing to buy the Professional version, if you do you'll receive a substantial 33 per cent discount. Trial the software before registration to test out the features.

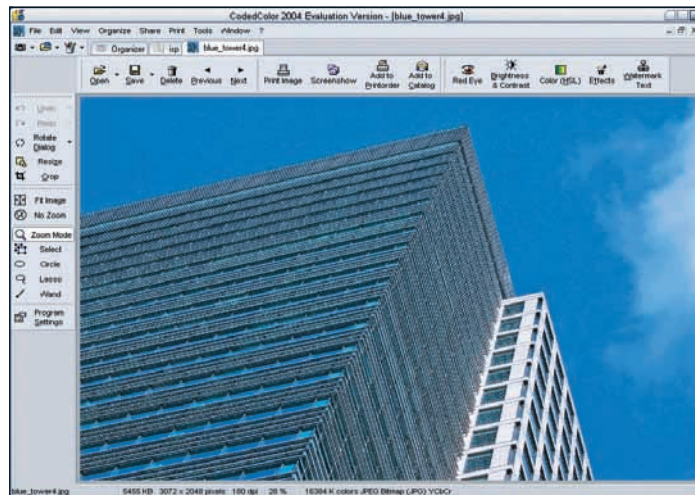
www.codedcolor.com

For many, a digital camera is a constant companion to be carried around as a matter of routine, along with the mobile phone, wallet and car keys. Hence the need to organise our ever-increasing image collection. Using CodedColor, we'll run through the process of editing, organising and distributing such captures efficiently.

Once you've brought the photos captured on your camera, back to your PC, you may simply transfer your images into your My Pictures folder, or, if you're organised, into sub-directories that provide some basic description of a particular collection. This may suffice for smaller collections, but you'll soon run into problems if you use this method as a long-term solution.

1 Editing images The initial interface to CodedColor is readily identifiable, providing a tree structure of your local system that enables you to access directories. Their contents are then displayed in thumbnail form along the top of the main viewing area, while individual selection will preview the larger image and provide EXIF information – such as the camera and shoot details – to the left, below the directory tree.

However, there will inevitably be some work that you'll want to carry out on your images, whether this is as simple as rotating or cropping, or a little



The software's 'Edit' mode provides a range of tools for making necessary adjustments to an image – from basic resizing through to adding effects and adjusting colour.

more advanced, with changes to the light or colour balance. Fortunately, CodedColor provides a modest collection of tools to take care of such tasks, which becomes available by hitting the 'Edit Images' button within the main toolbar.

Your currently selected image is transferred into Edit mode, from where you can carry out such routine tasks using the Selection tools available (to the left), and the common adjustment features listed within the revised toolbar, at the top of the interface. Use the 'Previous' and 'Next' buttons to move between images within the currently selected folder to continue editing images, or head back into the main folder (using the tabs at the top) to choose the Batch Conversion option. You can then, make mass changes to a selection of images.

2 Getting organised Once you've cleaned up your images, you'll no doubt want to organise them so you can easily access them – or group them together to browse through like a traditional photo album. CodedColor offers two methods of organisation, with catalogs or albums, both of which can be created easily using the corresponding buttons found within the central Organizer's main toolbar.

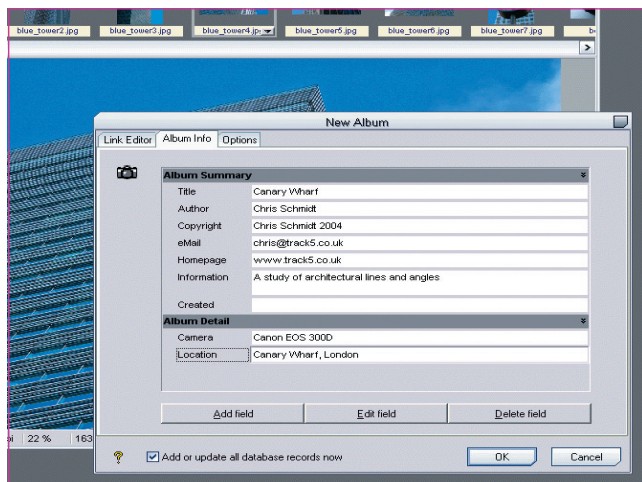
Catalogs are the most efficient method of organisation. The technique creates linkfiles to point to the actual

location of a file, whereas albums act as shortcuts to physical directories on your system. Catalogs allow multiple collections to be created. These can share assets without duplicating content, but only albums have the advantage of being exported to HTML, and entries are automatically added to a central, searchable database. Think of albums as sub-directories within your growing collection, and catalogs as transient collections.

When organising your images into catalogs, you may want to switch into 'icons' view. This provides easier access to check marks that will determine the content of any newly created catalogs. But once they're created, you can easily drag-and-drop images into catalogs, which make themselves available on a small pane at the bottom of the main Organizer window.

4 Image identity A picture may well paint a thousand words, but to a computer it is merely another mass of seemingly random bitmap pixels. For your computer to begin to recognise the content of your images, you'll need to provide some information that can be associated with individual files.

Selecting an individual image and clicking the 'Edit Annotations' option, found in the toolbar (or under the Edit menu) provides just the solution. Including a title, description and keywords is a common enough task,



As with annotating images, you can add a broad range of both preconfigured and custom attributes to your created albums.

which will ensure subsequent searches pull back the most relevant images. To save time when ploughing through groups of images, make use of the 'Control' buttons at the bottom of the dialog, which enable you to move through album contents sequentially, without having to constantly exit and relaunch the feature.

It may take some time, but adding such data to images will ensure that you find specific images more reliably in future. Using the 'Search' option within the main toolbar, you can generate some reasonably complex search criteria, which CodedColor will

process to reveal any resulting matches. Without such keywords, you'll find that your images will simply remain invisible to the process, and you'll have to resort to more manual methods of digging out appropriate files.

5 Sharing your memories But we don't take photos simply to file and organise them neatly away within the depths of our computer systems. Images are often taken to remember events or occasions that we may ultimately wish to share with those around us. The traditional photo album is a familiar item in most households, but with the development of digital cameras, more and more people are choosing not to print their images – but we still want to access and remember such occasions in the future.

One of the most available forms of sharing images with friends and relatives who may be anywhere around the world, is to upload collections on to the Internet, and using the 'Export Album' option we can do just that. It's a three-step process. First, you decide how much information should be associated with individual images, determine the amounts of optimisation and compression, and whether watermarks should be included to protect more sensitive copyright-reliant content. You can then decide on the colour scheme and layout of your

generated pages using a range of templates that CodedColor provides, along with options for including navigation, frame and thumbnail options. Finally, you determine the export options. Here, you decide where the final pages should be stored. You also have the option of adding autorun data, should you decide to burn the resulting files either to CD or to DVD.

Alternatively, you can choose to use Mail compression on individual images. This will optimise and create the necessary attachments for you to send images by email. CodedColor provides a wealth of other features, including specific options for print output, but you'll find plenty of invaluable advice in the comprehensive help files. **PCP**

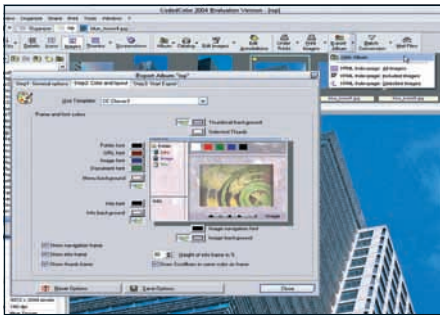
SUPPORT AND FURTHER ADVICE



The CodedColor website (www.codedcolor.com) provides additional downloadable extensions, including web album templates.

Email SuperDisc problems to pcplus.support@futurenet.co.uk

Exporting an album to a series of web pages – for display online, or to burn to CD or DVD – is a simple, three-step process using the dedicated wizard.



SCREEN-CAPTURE UTILITY

**FULL PROGRAM
AS SOLD FOR £17**

Solid Capture 1

Extend the Print Screen function to capture specific monitor content using Solid Capture

REQUIREMENTS



Pentium or equivalent, 32MB RAM, Windows 98

SERIAL CODE



After installation, 'Fetch' the unlock code. Complete the form, and the details will be emailed to you

UPGRADE

Save 30 per cent

When you order version 2 of SolidCapture from the online store, VoyagerSoft will provide a discount coupon code, enabling you to receive a 30 per cent reduction off the regular \$2995 (£16) price. The software will be available soon, and promises to extend its capabilities by being able to capture a scrolling window, and provide multiple monitor support.

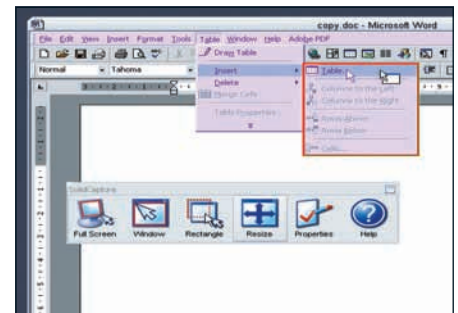
www.soliddocuments.com

A Even in collaboration with the [Alt] key, the default 'Windows Print Screen' function is a little limiting. Using the key to prompt 'Solid Capture' instead will give it a whole new lease of life when capturing more specific content from your monitor.

1 First things first The installation process for Print Screen is fairly routine. Determine your preferred keyboard shortcut to prompt the software, then follow the remaining options, taking the time to decide on how you want it to behave. Once installation is complete, you should be able to launch Solid Capture's floating toolbar, giving you access to a range of options such as capturing the full screen, an individual window and dragging a selection of your frozen desktop into your clipboard, or directly within your preferred image editor.

2 Beyond the basics

Taking time to run through the software's preferences will pay off. If you define and remember hot keys, this will make the process even more intuitive, opening up further options for your capture destinations, as well as expanding the potential of the software. For example, by default, [CTRL]+[F10] prompts the window capture, but holding down the [Shift] key when selecting available windows, enables you to capture multiple windows. Using the keyboard shortcut, you can even capture extended menu items; drill through your menus to a submenu and leave the mouse in position before using the [Control]+[F10] shortcut. You can now [Shift]-click over relevant dropdowns to specify what you want to grab. **PCP**



Capture an expanded menu, with mouse interaction, using the default Windows Print Screen method, not a digital camera.

SUPPORT AND FURTHER ADVICE



Still need convincing how limited the default Windows Print Screen method is? Go to <http://support.microsoft.com/default.aspx?scid=kb;en-us;173884>.

Email SuperDisc problems to pcplus.support@futurenet.co.uk

IMAGE MANIPULATION

**FULL PROGRAM
AS SOLD FOR £55**

Panoweaver 3.01 Standard Edition

Creating immersive 360-degree stitched images is a doddle with Panoweaver. There's no need to fiddle with perfect alignment – simply import your images and the software will intelligently piece things together, before enabling you to export the results

REQUIREMENTS



PIII 500MHz, 256MB RAM,
Windows 98 or higher

SERIAL CODE



Register the software at www.easypano.com/crm/key_extract.asp?productid=153414&magid=pcplus and the relevant code will be emailed to you

UPGRADE

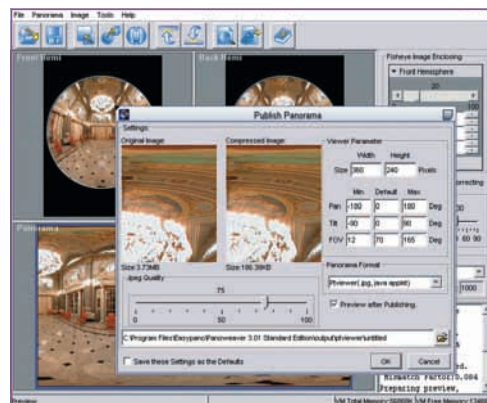
Pro Panoramas

The Professional Edition of Panoweaver offers finer control, and includes support for stitching up three fish-eye images that can be saved as multi-layer Photoshop PSD files – more information on upgrading can be found at www.easypano.com/upgradecenter.html. Alternatively, take things even further with Easypano's Tourweaver, which incorporates hotspots that enable you to move interactively between panoramic images. Using the code FUTURENETPCPLUS on the form at www.easypano.com/buynow_coupon.html will enable you to add the Tourweaver 1.25 Standard Edition to your shopping cart and be eligible for a 10 per cent discount off the cost. www.easypano.com

There are some locations where it's impossible to find a suitable vantage point, no matter how wide the lens of your camera may be. Standing in the middle of the Sistine Chapel or gazing in awe around the Grand Canyon are once-in-a-lifetime experiences for many people, but with the help of a tripod, a fish-eye lens and a copy of Panoweaver, it becomes possible to recreate such views and share them with your family and friends when you get back home.

hemispheres, and you'll need a fish-eye lens that is capable of capturing an image of 360x180 degrees.

You don't need to worry about going out and finding exactly the right location – take a look at the handy example files included first, which illustrate and explain the concept behind this program.



1 Capture your image

Panoweaver is a great image utility that easily stitches together immersive spherical or cubic images into a single skin; this maps to the inside of a virtual Java-driven sphere or cube, enabling you to rotate it within the final image. The results will be as high-quality as the original imagery you supply the program with.

When taking the initial shots, a tripod is essential – this will ensure a constant central point. If you keep an eye on visual landmarks between shots, and allow for some overlap when you rotate around your chosen subject, Panoweaver shouldn't have any problems putting things together. Using a Pano Head will help to eliminate any displacements between

2 Put it together

With your images taken, you can launch Panoweaver and open them up, specifying the sequence of your chosen form of panorama. The preview of your original images allows for some routine adjustments, in case you need to line things up manually. You also have the option of adding ceiling and floor attributes, should you decide to cover any blindspots – produced, for example, by your tripod being captured within the shot.

3 Share your vision

After that, it's a case of letting Panoweaver do its thing and stitch your images together. With the Spherical or Cubic options, the resulting panorama may look a little convex, as

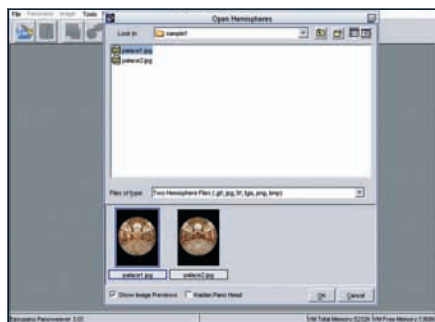
Exporting the results forms the final part of the sequential conversion process that Panoweaver provides – and everything is icon-driven.

the program effectively skins the inside of a sphere. However, if you hit the Preview button, you'll soon appreciate how effective the process can be.

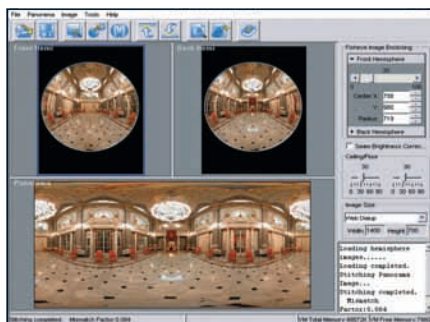
You have the option to optimise the output for various media, including web and CD, as well as decide whether to use the proprietary Java-driven PTVIEWER or the Real-time VR formats for your final image.

The entire process is straightforward, and generally involves working your way through an icon-driven interface, but Panoweaver's finished results are much more rewarding than a straightforward 2D photograph. **PCP**

Put yourself in the picture



1 Hit the only available button in the program to choose the assets and methods you want to stitch together. Next, choose the Two Hemisphere Files option and locate the sample1 folder (this comes with the software). Select the Front option, 'associate' the palace1.jpg file to the front hemisphere and palace2.jpg will assign itself to the back. Click OK.



2 The two images now become available within the software, from where you can make any necessary adjustments using the options available to the right of the interface. Once you're happy with the result, hit the Auto Stitching button for a preview of the flattened image, then choose one of the available Image Size options.



3 To fully appreciate the results, hit the Preview button and Panoweaver will render the final image within your web browser, along with useful instruction as to how the applet might be embedded into a web page. Any further edits can then be carried out before you finally come to publish the completed panoramic image.

DIGITAL IMAGING

FREWARE

Graphics toolkit

Whether you're after an image-editing application, asset-management tools, a graphics viewer, or you simply need to get rid of flash reflections, there's something for everyone here – including *The GIMP*, *Adobe Photoshop Album 2*, *IrfanView 3.91* and *RedEye 1.5*

REQUIREMENTS



Pentium, 128MB RAM, Windows 98 or higher, Internet Explorer

SERIAL CODE



Not required

UPGRADE

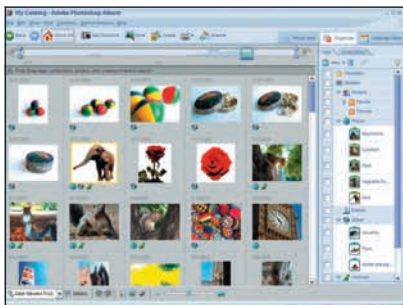
Stay up-to-date

We've supplied the current versions of IrfanView, RedEye and The GIMP, but the latter, being open-source, tends to get updated fairly regularly – check out www.gimp.org for the latest news and downloads.

The full version of Photoshop Album 2.0 builds upon the Starter Edition on this month's SuperDisc, with greater search and organisational tools and much more extensive image-editing options. More information can be found at www.adobe.co.uk/products/photoshopalbum/main.html.

The commercial 8.0 version of Ulead Photo Explorer is now a couple of generations beyond its freeware predecessor, and naturally has plenty of new tricks up its sleeve. It costs £2995 – find out more at www.ulead.com/pe/runme.htm.

www.gimp.org
www.adobe.co.uk
www.ulead.com



Adobe Photoshop Album could be all you need to organise your images, with keywords, print options, galleries and more.

The surge in digital photography over recent years has meant that personal image collections are expanding at an alarming rate. There are numerous applications for organising and editing your images, but just where should you spend your hard-earned cash? Well, maybe you don't need to. There's plenty of superb free software out there, and we've rounded up some the best.

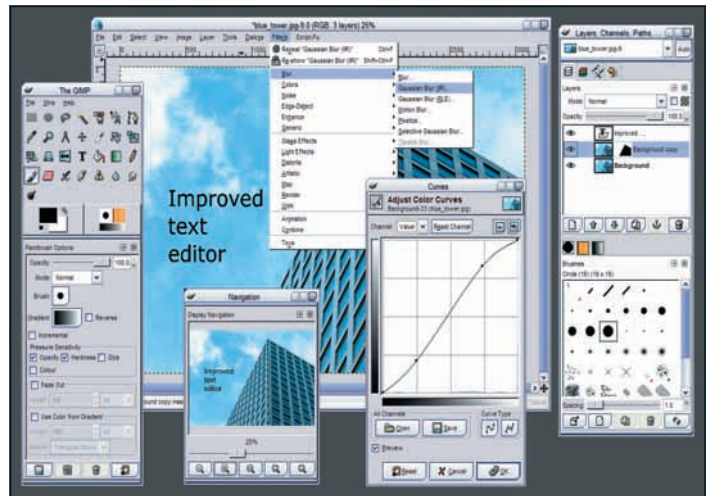
1 The GIMP 2.0.2 The most feature-packed freebie on this month's SuperDisc is the open-source community's favourite image editor, The GIMP. This provides tonnes of features for touching-up photos or creating artwork from a blank canvas.

The installation might prove a little fiddly, but you can find full details in this month's MasterClass on page 164. Once up and running, you'll find The GIMP 2.0.2 to be more user-friendly and stable than previous versions.

2 IrfanView 3.91 While The GIMP provides all you need to edit your bitmap imagery, IrfanView will be sure to help you find them. This graphic viewer supports a massive range of image formats that includes all the major types, plus many native to the Macintosh, as well as a comprehensive range of video and audio formats that really puts Windows Explorer to shame.

This tool offers thumbnail previews, the ability to create slideshows, its own integrated media player – and, not to mention, a range of practical tools that enable basic image editing and batch conversions. It's a tiny freeware app that will run on pretty much anything since Windows 95, and it's sure to become an essential utility for locating images – saving you from having to wait for dedicated apps to load and display your files.

3 Adobe Photoshop Album 2 We can now find and edit our images, but what about getting them in order? Thanks to graphics giant, Adobe, this Photoshop Album 2.0 Starter Edition will



An improved interface and official Windows support finally make The GIMP weighty enough to be a serious contender in the image-editing market.

take care of such an essential task.

As a limited version of its commercial title you don't get the complete functionality of version 2.0, but all the core functions are here that will enable you to view and organise your image library.

Within the software, you can perform basic fixes to all the most common problems – such as rotating and cropping files, as well as optimising your hefty digital camera files into something a little more email-friendly. Keyword association will help you keep track of your library, while you can rest assured that only copies of your originals will be edited.

4 Ulead Photo Explorer 6.02

But if the Adobe option isn't for you, give Ulead's freeware version of its popular Photo Explorer a try. This tool will enable you to visually organise and share your existing digital photographs, audio and video files. New files can be easily imported using the integrated digital camera wizard, or you can scan your favourite websites to download images, audio and video they might contain.

Web albums and slideshows can be created, while print options enable you to create hard-copy versions of all your files. You can even share your images online, courtesy of a free account that makes it possible to create and send e-cards.

5 RedEye 1.5 It comes as a real surprise that many advanced image-editing packages, including The GIMP (and even Adobe Photoshop for that matter) have no dedicated options for cleaning up that most annoying anomaly: flash red-eye. However, using this tiny little application, you can take care of the problem once and for all with a simple click of the mouse – saving you from the long-winded process of working through the options in The Gimp or your own image-editing program.

This tool completes a broad-ranging collection of titles. Using all of these programs, there shouldn't be any need for you to lose track of your images again. And being freeware, you know that if a particular package fails to impress, you can simply remove it without cause for regret. If the applications do capture your imagination – and we think they will – be sure to check out the benefits of upgrading to enjoy the further benefits available in new versions. **PCP**

SUPPORT AND FURTHER ADVICE



See the Computer Arts (www.computerarts.co.uk) and Digital Camera (www.dcmag.co.uk) websites for advice on getting creative with your computer.

Email SuperDisc problems to pcplus.support@futurenet.co.uk

MandrakeMove

Running Linux doesn't mean you have to have it installed on your hard drive – MandrakeMove lets you run your entire system from CD, including games, office software, and web surfing

REQUIREMENTS



300MHz Pentium, 64MB, Fast CD-ROM drive, a free USB port if you want to save your files

SERIAL CODE



www.xeque.com/offer/pcp-spm-5

UPGRADE

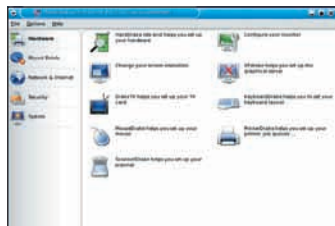
Get the latest features

MandrakeMove 2 should be available by the time you read this, and as it's based on Mandrake 10 (a newer release) it comes with kernel 2.6, KDE 3.2, Samba 3, and various other tools that make it a very worthwhile upgrade. You can download the latest version from Mandrake's homepage: www.mandrakelinux.com. As this current release of MandrakeMove was the original release, many of the tweaks in the second release correct problems that only became available after this one had been tested by the masses!

www.grsoftware.net

Whether you want to try Linux because it's free, because it's more secure, or because it doesn't require a high-end CPU to work, chances are you won't want to install it straight away. This is the most common reason for using a Live CD distro like MandrakeMove, but it's capable of so much more: unlike distros before it, MandrakeMove can store all its data on a USB key, meaning that when you reboot, all your settings are saved, and it even enables you to eject the disc while it's running.

The two most popular uses for a full-time MandrakeMove CD are as a portable computer (you just need to carry the CD and your USB key around with you to get all your work wherever you are) and as a system repair CD – you can mount your hard disks and fix any mistakes on your system.



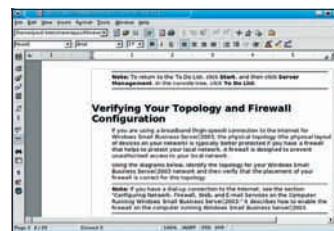
Mandrake Control Center is where it's at, but remember that unless you save your settings to disk it all gets lost on reboot.

1 Initial setup Being a Live CD, you don't need to clear any hard disk space to use MandrakeMove – just pop your CD in (make sure you have CD booting enabled in your BIOS) and reboot. You will be prompted to create a user during boot up, but that's just so that MandrakeMove can lock your screensaver with a password if you leave it alone. Startup will take quite some time because it has to detect and configure all your devices on each boot.

Once it's up and running, click the K button in the lower-left corner and select 'Administer your System' – the 'Configure your computer' followed by 'Configure your desktop' links are where most of the setup can take place. Please note that in a normal Linux distribution there is an administrator ('root') password set, but this is disabled in MandrakeMove to make it easier for first-timers. As a result, when the 'Configure your computer' dialog pops up, any changes you make will become permanent, usually *without* an 'undo' option – be careful!

2 Set up your office

MandrakeMove comes supplied with the OpenOffice.org 1.1 (OOo) office suite for text editing, spreadsheets, and presentations. OOo isn't fast at the best of times, but you'll need to be extra patient, as it has to load entirely from

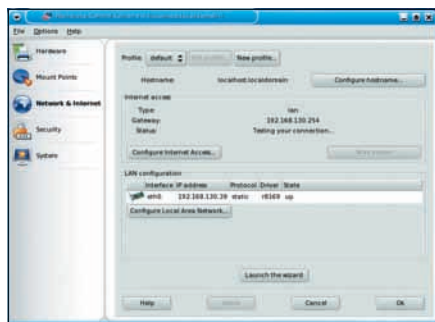


OpenOffice.org can load and save Microsoft Office documents – here's one loaded straight from the Microsoft site.

CD. There's also GnuCash for personal accounts, MrProject for project management, and Dia for flowcharts and other diagrams.

OpenOffice.org works (for the most part) like Microsoft Office, and exceeds it in some ways. For example, while all the standard Office file formats are supported (Word .doc files, Excel .xls files, etc), you'll also find that OpenOffice.org Writer can export direct to PDF, and OpenOffice.org Impress (the PowerPoint equivalent) can save its presentations to Macromedia Flash format. One thing that OOo doesn't cope well with is password-encrypted documents, and you should avoid them. If you really need to read a password-encrypted file, you'll need to download and install Wine (to the RAMDisk) from RpmFind, as this should let you run Microsoft's Word Viewer. It's a bit of a cheat, but it works.

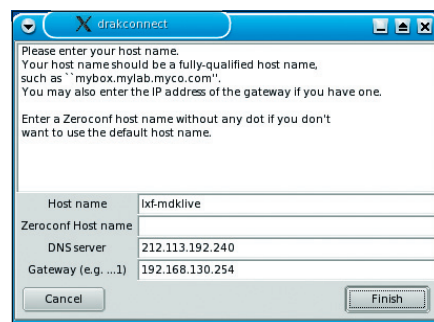
Configure your network



1 To get connected to the network you'll need to provide Mandrake with your network details. This is done using the Mandrake Control Center (click 'Configure your Computer' to get there), selecting 'Network & Internet' from the left-hand panel, then 'DrakConnect'



2 Unless you have specific requirements for your networking (such as the ability to hotplug your card) you should go with the network configuration wizard. Mandrake has probably already detected your network card, but you may need to tweak your DNS settings and/or the gateway.



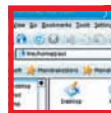
3 Once the wizard is complete, you'll need to restart the network and also restart any Internet programs in order to get the connection working. Naturally you should avoid restarting the whole computer, as MandrakeMove resets on reboot!

The interface at a glance...

Desktop icons
There are icons on the desktop for the most commonly used programs.



Location bar
Either type URLs directly in, or select them from the dropdown menu to browse through your history.



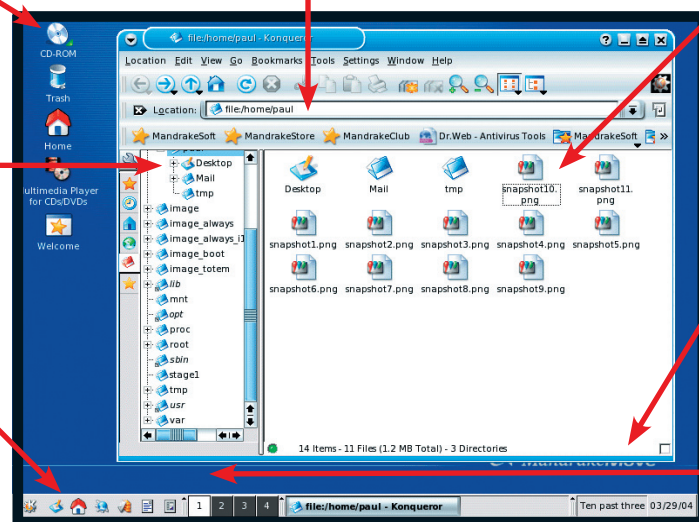
File browsing
Konqueror will preview most filetypes by default, but you can disable that if you find it too slow.



Browsing sidebar
You can enable Konqueror's sidebar to help you browse around your computer



Launch programs
The K button in the lower-left corner is where the programs menu lives.



System tray
Here's where the clock and any resident programs that are running are shown.



Virtual desktops
MandrakeMove gives you four virtual desktops as standard, giving you more screen real estate.



3 Web and email Like the office programs, the Internet programs don't offer any choice either – you get Konqueror, which is the default KDE web browser, and little else. That said, Konqueror was chosen by Apple as the renderer for its Safari web browser, and is exceptionally standards-compliant. You may want to set it up to mimic Internet Explorer – go to Settings, 'Configure Konqueror', then select 'Browser Identification' from the left-hand panel. Doing so will prevent any IE-focused sites whimpering when you try to log on.

For email MandrakeMove provides KMail, which works fine with POP3,

IMAP, and SMTP emails. Unless you're saving your MandrakeMove session to a USB key, do make sure to de-select 'Delete messages from server' otherwise your inbox will be empty when you reboot.

4 Chill out and have fun

MandrakeMove comes with a small selection of games, of which the best is Frozen Bubble. (The popular Tux Racer runs like a dog without a dedicated driver for your 3D card. Getting that driver means installing Mandrake onto your machine, which you can't do). For chatting to friends, give Gaim a try – it supports AOL

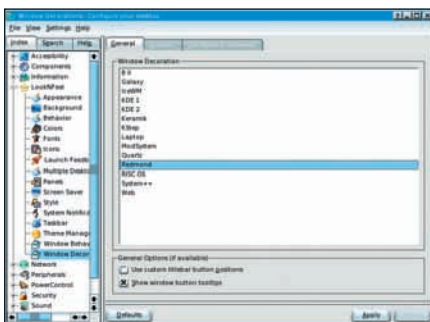
Instant Messenger, Yahoo, MSN Messenger, and ICQ all in one. Of these, the first three have been known to change their protocols without warning, so you might have trouble.

You'll find tools to listen to music, watch movies, and even watch TV (you'll need a supported card for this). The only downside is, again, the driver issue – watching movies won't be very smooth unless you have a supported video card, and you may get no sound at all if your sound card uses an obscure chipset. Driver issues are more likely if you're using on-motherboard devices such as onboard sound, networking, etc. **PCP**

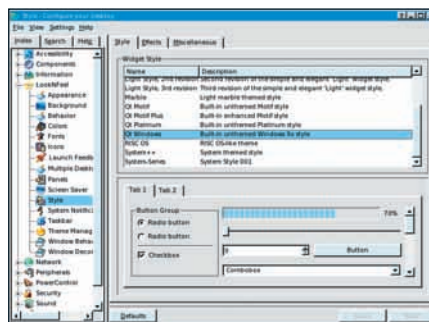
FURTHER SUPPORT

If you're new to Linux and aren't yet sure if you want to plough ahead with a full install, you might want to visit the Linux Documentation Project at www.tldp.org – it has a comprehensive range of tutorials on a variety of topics to help get you started. For Mandrake-specific help, visit www.mandrakeexpert.com and you'll find Mandrake's community support forum where experienced users answer questions from newbies about all of Mandrake's distros.

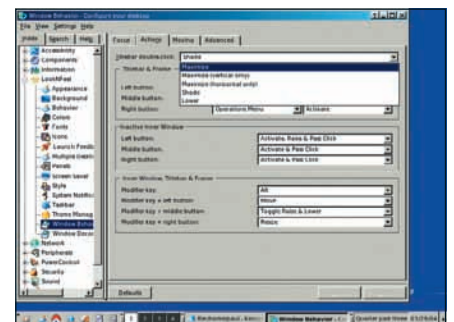
Make it look like windows



4 Migrating to Linux is a hard task, so why not make life easier by making the interface a bit more familiar? This can all be done with the KDE Control Center, found under 'Configure your desktop'. Change the Windows Decoration to Redmond – this will give you the standard Minimise, Maximise, and Close buttons on your top-right



5 Next, go to the Style window and look for Qt Windows – this forces KDE to adopt a clunky, Windows 98-esque theme for its GUI widgets – scrollbars, buttons, etc. The colours will probably not look quite right, so go to the Colours window and selected Redmond 2000 to get the graduated title bar and yellowish-grey widget colouring.



6 By default, double-clicking the title bar in Linux 'shades' the window so that only the title bar is visible. This usually confuses regular Windows users and is only going to slow you down – to change it, go to Window Behaviour, and, from the Actions tab, select 'Maximise' from the 'Titlebar double-click' combo box.

PERSONAL FINANCES

FULL PROGRAM

Intuit TaxCalc Lite 2004

Calculating your taxes is complicated enough to baffle Stephen Hawking, but help is at hand. TaxCalc Lite 2004 walks you through your tax return onscreen, and calculates the final bill. Your figures are submitted to the IR online, avoiding postal problems and costly fines

REQUIREMENTS



Pentium 2 300MHz,
32MB RAM, Windows
98 or later, 40MB hard
drive space, Internet
connection

SERIAL CODE



Not required

UPGRADE

Getting the full version of TaxCalc 2004 means saying goodbye to those Lite restrictions: no £20,000 top income limit, you get every single Inland Revenue self-assessment form, and the return can be submitted on paper as well as online.

Other new features include Live Update, automatically upgrading TaxCalc 2004 over the Internet as new features become available. A job-related expense checksheet makes sure you're claiming all your allowances, while automatic save protects your work, even from unexpected crashes.

TaxCalc 2004 is available in three varieties. For personal use, there's the download version at £24.95, or a boxed copy for £29.94. Financial professionals may prefer TaxCalc 2004 Pro, which offers unlimited client returns amongst other extras. Place your order at www.intuitshop.co.uk

www.taxcalc.com

It's hard to get excited about filling in your tax return, especially when the deadline isn't until 31 January next year. However, leave it 'til after Christmas at your peril, as there are several potential 'gotchas' to trip you up. Take some advice and make sure everything runs smoothly.

1 Understanding TaxCalc Lite

This is a restricted version of the full TaxCalc program, and won't be suitable for everyone. It has three main limitations: firstly, the program will only complete returns where the total pre-tax income is £20,000 or less. Secondly, it only includes the standard form and employment pages, so you can't use it to declare income from self-employment. And thirdly, it can only be used to file a return online. You can't use it to produce a paper return.

Not worried by these restrictions? There's more. You can't do anything until you've got an official User ID and Password. And you can't get these without registering online, then waiting for an official Activation PIN to arrive in the post. This may take several days, so register at least a week before the final deadline. Follow the instructions at the Inland Revenue site (<https://online.inlandrevenue.gov.uk/index.jsp>).

2 Getting started While you wait for your Activation PIN, gather all the paperwork you're going to need: your

Click "Forms" on the TaxCalc Lite toolbar if you'd prefer to work with onscreen forms that look like a paper tax return.

employer's P60 form detailing your wages for the year, a statement from your bank saying how much interest they paid you last year, and so on.

Now launch TaxCalc Lite and click File/New/SA100 2004 Personal to launch the EasyStep wizard. Read the instructions, then click Next through to the Personal Details section, and start filling in the forms. You could progress through the entire return in sequence, by completing a page and clicking Next. Or perhaps it's more convenient to jump between the sections? Move to them directly by expanding a section of the "Easy steps" tree. Completed sections turn green, the rest stay red, so it's immediately obvious how much work you've got left.

3 Error checking Even though TaxCalc Lite only includes the most basic tax return pages, it's still easy to forget a section. Click on the Check tab once you've finished, and the program will highlight any errors. Very occasionally an error message only indicates that your data is 'likely' to be incorrect, perhaps because some figures you've provided don't match a total entered elsewhere. If you're confident that you're right and TaxCalc Lite is wrong, then click 'Sign Off' to dismiss the error.

These error checks are reassuring, but keep in mind that they can only spot fundamental problems like a

missing address. More subtle issues (declaring £100 capital gains instead of £1000) won't be detected, so take great care when entering data.

4 Final filing Once you've completed and checked the form, TaxCalc Lite displays your bill in its 'Tax payments due' section. The subsequent 'How to pay your tax' section explains how you can pay by Internet banking online, using a debit card, by post or Bank Giro.

With any luck you've now got your Inland Revenue Activation PIN. Follow the instructions provided to enable your User ID and password. The PIN expires within 28 days, so get on and do it or you'll have to send off for another one.

Once the Revenue has confirmed your online identity, click Finish/File by Internet, enter your User ID and Password, then click Submit. In a few seconds your return details will be passed to the Inland Revenue, with an immediate acknowledgement. And you can relax – that's your tax worries over for another year. **PCP**

SUPPORT AND FURTHER ADVICE



Got more tax questions? Search for the answers online first at www.inlandrevenue.gov.uk

Email SuperDisc problems to pcplus.support@futurenet.co.uk

TaxCalc Lite highlights some common mistakes, helping you to create an accurate tax return form.

PCPlus WAVEY'S WEB

→ Your expert guide to the most essential sites

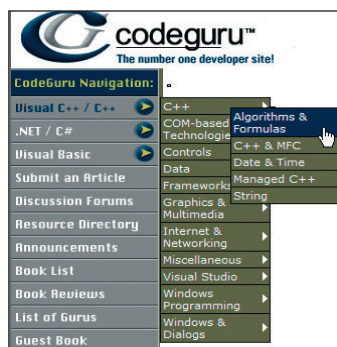


Davey Winder
waveysweb@futurenet.co.uk

Davey Winder is an award-winning technology journalist and a founder member of the Internet Society of England

You can never have enough information. **Davey Winder** has been hunting down those essential developer resource websites

You may think of program developers as a beard and sandals fraternity, who code to live and live to code. Many of them are, but many are just like some of you: the hobbyist programmer creating utilities for your own use. Just because you don't get paid for it doesn't make you any less of a developer, or any less entitled to share in the huge resource of help, advice, code samples, tutorials and inspiration that the web has to offer the developer community.



Developer.com

www.developer.com

We usually recommend against trying generic names for resource searches. This is due to the fact that being confronted with sexually explicit images often offends. However, with Developer.com you get exactly what you expect, although you might call it 'developer porn' as it turns us on here. This is a huge collection of articles, tutorials and news releases covering every conceivable programming language and development arena that you can think of. Although you may be tempted to go no further than reading your way through the articles that interest you, don't hold back. The user forums are buzzing with free advice, and loaded opinion, while the CodeGuru microsite should be obligatory for avid readers of PC Plus contributor, Dave Jewell.



O'Reilly Network

www.oreillynet.com

O'Reilly has already carved a well deserved reputation as one of the best publishers of books aimed squarely at the programming and developer market, but you may not have thought to turn to its website for additional free resources. Big mistake, because this is one of the web's hidden gems. Drawing on the expertise of its pool of authors, the O'Reilly Network has newsfeeds, a learning lab (paid-for remote learning course based around the books), the inevitable plug for books and a huge searchable archive of previous postings. However, we recommend you head straight for the Developer Weblogs section where you'll find some of the most interesting and inspiring posts from respected authorities on various programming languages and development environments.



DevShed

www.devshed.com

Not everyone takes the Microsoft dollar and develops Windows based applications. Linux has provided perhaps the biggest kick up the rear for Mr Gates and the pool of dedicated open source developers continues to

grow. As a natural consequence there is no shortage of relevant sites online, but two stand out. First, there's SourceForge (sourceforge.net), the world's largest repository of Open Source code and applications, and then there's DevShed. If your particular interest is in open source web development, you've come to the right place. This website is stuffed to bursting with code, scripts, discussion and advice on Apache, MySQL, Perl, PHP, Python and XML. We really like the BrainDump section that is best described as a potpourri of useful programming outpourings.



Wireless Developer Network

www.wirelessdevnet.com

And talking of programming potpourri, there are a handful of sites we just had to mention this month, albeit briefly, as they are vital online developer resources. Our own PC Plus Online (www.pcplus.co.uk) has a huge archive of articles and a lively discussion forum. PocketPC developers will love the aptly titled PocketPC Developer Network (www.pocketpcdev.net) while anyone thinking about creating a Google-based application should visit www.google.com/apis. Developer Fusion (www.developerfusion.com) is another of the all-you-can-eat type resource portals, with a particular penchant for .NET tutorials. Our featured site has to be the Wireless Developer Network though, be it WAP, WiFi, Bluetooth, SMS or Java as long as it's wireless, it's covered here. **PCP**

Site of the month



Microsoft Developer Network

msdn.microsoft.com
The big IT names are excellent resource stomping grounds. Take DeveloperWorks (www.ibm.com/developerworks) from IBM with its downloads, forums, blogs and tutorials in a magazine style format covering everything from DB2 to XML. Novell (developer.novell.com), Sun (developers.sun.com) and Apple (developer.apple.com) all offer well populated developer sites. Microsoft, however, steal a march on them all with MSDN. If your work involves Microsoft then you need access to the information, tutorials and code that MSDN community provides. There's also access to the searchable Microsoft knowledge base and MSDN library for good measure. The only downside is, like many things, you get what you pay for. And although there is a huge raft of free stuff, MSDN also features some subscription only content. Browse the subscription section to see if it's worth the money for your particular needs.



If you know of an essential website, or are involved in a worthy contender for the title, then please let me know at waveysweb@futurenet.co.uk